U.S. Department of the Interior
National Park Service

Rehabilitation of Callville Bay Road
Lake Mead National Recreation Area
Clark County, Nevada

Summary

At Lake Mead National Recreation Area, the National Park Service proposes to rehabilitate and reconstruct the 4-mile long Callville Bay Road. This action is needed to improve poor pavement conditions, rehabilitate deteriorated and inadequate drainage facilities, reduce traffic accidents, and improve vehicle and pedestrian circulation in parking areas.

This Environmental Assessment examines in detail two alternatives: no-action and the National Park Service preferred alternative. The preferred alternative includes the rehabilitation of the existing roadway starting at the intersection with Northshore Road and ending at the launch ramp and marina at Callville Bay. Six pullouts would be obliterated, either to eliminate the safety hazard or due to road realignment. Two new pullouts would be constructed. The parking lot would be resurfaced and re-striped to provide a two-lane stacking area and a one-way through-travel lane for emergency vehicle access and concession visitors.

The preferred alternative would have no or negligible impacts on cultural resources, wetlands, prime and unique farmlands, ecologically critical areas, environmental justice, park operations, natural soundscapes, and lightscapes. Short-term, minor, adverse impacts on biotic communities would result from road reconstruction activities. Short-term, negligible, adverse impacts to the desert tortoise could result from alteration of movements, egg destruction, and intentional capture and movement of vulnerable individuals. Long-term impacts to the desert tortoise from installation of permanent tortoise fence would be slightly beneficial. There would be minor, long-term, localized, adverse impacts on floodplains. Impacts to water quality from erosion and sedimentation would be short term and negligible to minor. Short-term air quality impacts from dust and emissions would be adverse and minor. Impacts to soils would be long term, localized, adverse, and minor.

Short-term impacts on visitor use and experience would be minor and adverse if construction occurs during non-peak visitation periods. If the project extends into peak season or weekends, impacts would be moderate. Long-term visitor use and experience impacts from road improvements would be slightly to somewhat beneficial. Short-term health and safety impacts would be slightly beneficial; long-term health and safety impacts would be somewhat beneficial, resulting from improved sight distances, wider travel lanes, and circulation improvements. Short-term impacts to concessions would be minor to moderate and adverse; long-term concessions impacts would be negligible to slightly beneficial.

Notes to Reviewers and Respondents

This Environmental Assessment is available on the Lake Mead National Recreation Area Internet Web site. It is being distributed for public and agency review and comment for a period of 30 days.

If you wish to comment on the Environmental Assessment, you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. *If you want us to withhold your name and address, you must state this prominently at the beginning of your comment.* We will make all submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to:

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Boulder City, NV 89005

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

AADT	Average Annual Daily Traffic
BA	Biological Assessment
BMP	Best Management Practices
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
ºF	Degrees Fahrenheit
DO	Director's Order
EA	Environmental Assessment
GMP	General Management Plan
MP	Milepost
NEPA	National Environmental Policy Act of 1969, as amended
NHPA	National Historic Preservation Act, as amended
NNHP	Nevada Natural Heritage Program
NPS	National Park Service
NRA	National Recreation Area
NRHP	National Register of Historic Places
Service	U.S. Fish and Wildlife Service
SHPO	State Historic Preservation Officer
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service

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INTRODUCTION

PURPOSE AND NEED FOR ACTION

The National Park Service (NPS) is considering the rehabilitation of Callville Bay Road within Lake Mead National Recreation Area (NRA), Clark County, Nevada. This approximately 4-mile long (approximately 6.0 km) access road connects Northshore Road with the marina, temporary residences, parking area, boat ramp, and NPS employee and concession housing areas adjacent to Callville Bay (**Figures 1 and 2**). This action is needed to improve poor pavement conditions, rehabilitate deteriorated and inadequate drainage facilities, reduce accidents between mileposts (MP) 0.7 and 3.0, and improve vehicle and pedestrian circulation through the parking areas. Many of the vehicles traveling the road are pulling trailers, and data indicates that accidents may occur when a vehicle or trailer wheel veers off the pavement onto the unpaved shoulder (see **Figure 3**). Research has indicated that a minimum 12-foot wide travel lane with 4-foot paved shoulder is necessary to ensure safety.

An Environmental Assessment (EA) analyzes the proposed action and alternatives and their potential impacts on the environment. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 as amended, regulations of the Council on Environmental Quality (CEQ) (40 *Code of Federal Regulations* (CFR) 1508.9), and the National Park Service Director's Order (DO)–12, *Conservation Planning, Environmental Impact Analysis, and Decision-making.*

RECREATION AREA PURPOSE, SIGNIFICANCE, AND MISSION

An essential part of the planning process is understanding the purpose, significance, and mission of the recreational area for which this EA is being prepared.

Recreational Area Purpose

Provide public recreation, benefit, and use in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and preserve the scenic, historic, scientific, and significant features of the area (NPS 2000b).

Recreational Area Statement of Significance

Lake Mead NRA is the premiere inland water recreation area in the West with 1.5 million surface acres, including 700 miles of shoreline on Lakes Mead and Mojave. It represents superlative examples of the plants, animals, and physical geography of the Mojave Desert, Colorado Plateau, and Basin and Range geologic provinces. The park includes many regionally and nationally significant natural resource components including populations of federally listed threatened and endangered species of animals, birds, fish, and plants. The area

also represents a continuum of cultural resources from prehistoric to historic sites, including several culturally sensitive areas with sacred and traditional significance to contemporary Native Americans.

Lake Mead NRA provides a wide variety of unique outdoor recreation opportunities ranging from warm-water recreation to exploration of rugged and isolated backcountry, making it a wilderness park in an urbanizing setting. The area generates over $500 million directly for the local economy. Lake Mead NRA serves as a major focus in the western United States for public outdoor water recreation, which is at a premium in this desert environment. The area is within a day's drive of 20 million people in the Los Angeles Basin and 2.7 million people in the Phoenix metropolitan area. Lake Mead is also within a 20-minute drive of the 1.1 million people in the Las Vegas Valley, with up to 6,000 new residents per month and 30 million visitors per year, making Las Vegas one of the fastest-growing communities and tourism destinations in the country (NPS 2000b).

Recreational Area Mission

To provide diverse inland water recreational opportunities in a spectacular desert setting for present and future generations (NPS 2000b).

PROJECT BACKGROUND

Callville Bay Road begins at the intersection with Northshore Road (MP 0.0, Station 10+000 - metric) and ends at the boat launch ramp and marina for Callville Bay (MP 3.8, Station 16+210). The road contains numerous curves and travels downgrade (2% to 6%) from Northshore Road to the Lake Mead lakeshore. Callville Bay Road is typically 22-feet wide and paved, with centerlines, shoulder lines, and 4-foot wide gravel shoulders. The shoulder areas have been graded along both sides of the road. The posted speed limit on the route is 35 miles per hour (mph). Traffic volume data from NPS Count Station 1915 on Callville Bay Road shows that average annual daily traffic (AADT) on the route in 1995 was about 510 vehicles per day. NPS count data collected in 1991 showed that the seasonal average daily traffic volume on the road was more than 900 vehicles per day. Although more recent traffic data is not available, Callville Bay visitation for 2001 was 664,998 people. At an estimated 3.3 persons per vehicle, the average number of vehicles per day was 552, not accounting for seasonal fluctuations and peaks.

In 1995, the National Park Service conducted a Traffic Safety Program Review for roads within Lake Mead NRA (Robert Peccia and Associates, Inc. 1995). Callville Bay Road had the second-highest accident rate for a road segment in the NRA. The most apparent driver error on Callville Bay Road is that motorists bound for the lake often travel at excessive speeds. This is a particular problem for vehicles towing trailers. Motorists heading downgrade too fast may have difficulty negotiating curves on the route. Recommendations in the report included road reconstruction to 32-foot wide (12-foot lanes with 4-foot shoulders) (Robert Peccia and Associates, Inc. 1995).

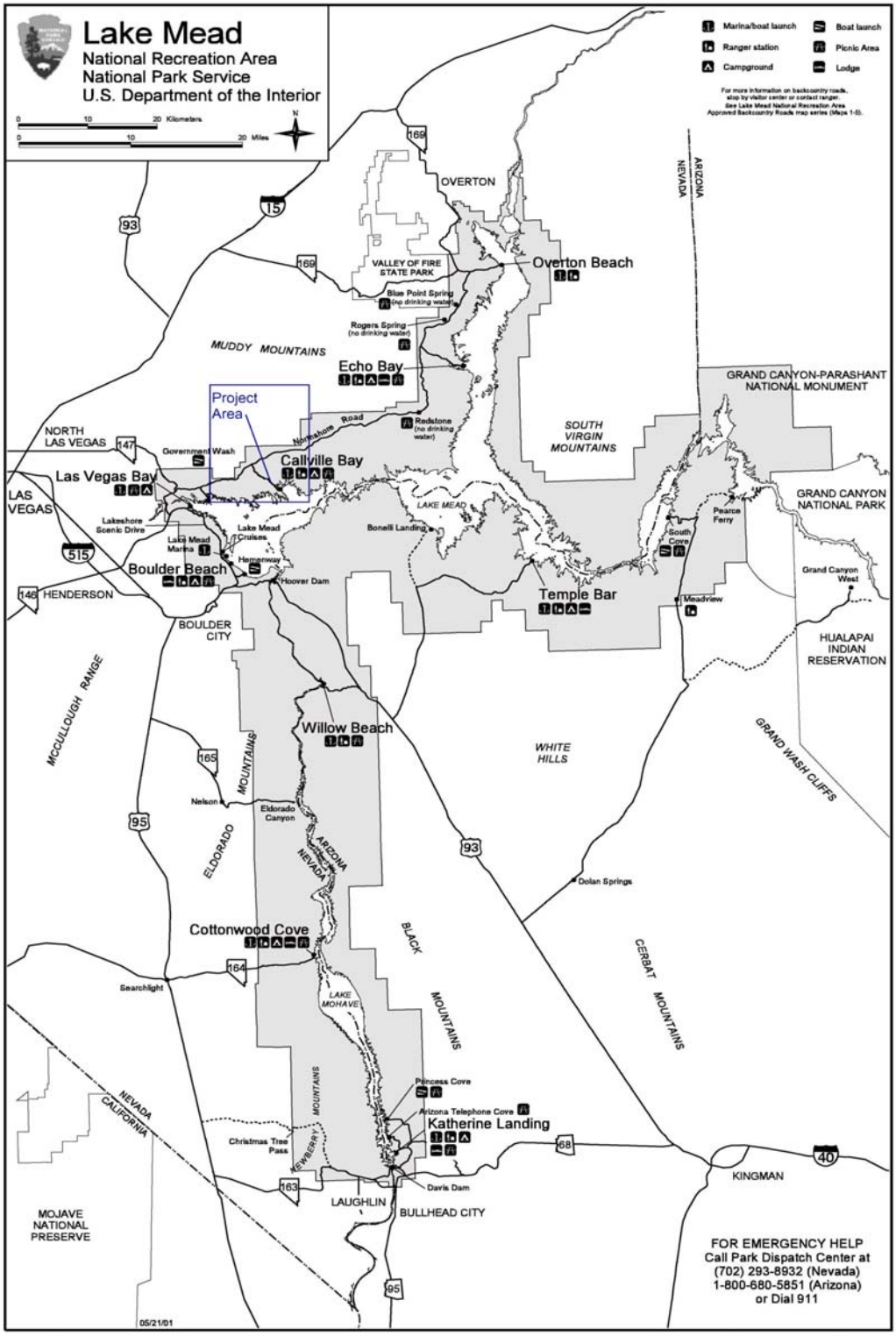

FIGURE 1. AREA MAP OF LAKE MEAD NATIONAL RECREATION AREA

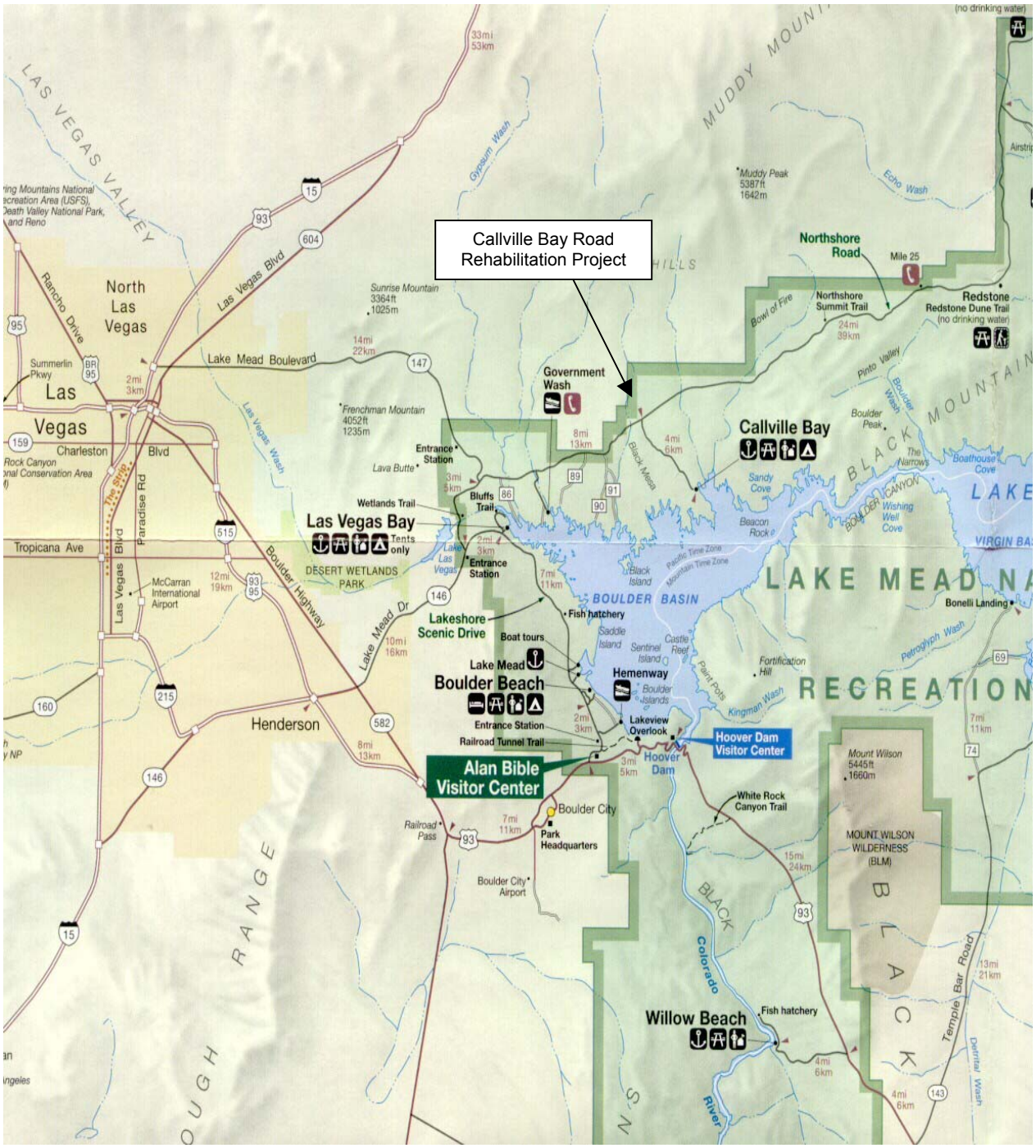

FIGURE 2. REHABILITATE CALLVILLE BAY ROAD PROJECT SITE

FIGURE 3. PHOTO OF UNPAVED SHOULDER OF EXISTING CALLVILLE BAY ROAD

SCOPING

Scoping is the effort to involve agencies and the general public in determining the scope of issues to be addressed in this EA. Scoping determines important issues and eliminates issues that are not important; allocates assignments among the interdisciplinary team members and/or other participating agencies; identifies related projects and associated documents; identifies permits, surveys, consultations, etc. required by other agencies; and creates a schedule that allows adequate time to prepare and distribute the EA for public review and comment before a final decision is made. Scoping includes any interested agency, or any agency with jurisdiction by law or expertise (including the State Historic Preservation Officer (SHPO) and Indian tribes) to obtain early input.

Internal scoping was conducted by staff of Lake Mead NRA and resource professionals of the NPS Denver Service Center. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined the likely issues and impact topics, and identified the relationship of the proposed action to other planning efforts at the NRA.

A press release initiating scoping and describing the proposed action was issued in May 2002. Comments were solicited during a public scoping period that ended May 30, 2002. No comments were received. A letter was also sent to the U.S. Fish and Wildlife Service (Service), and an onsite informal consultation with the Service was held March 14, 2002. The

public and American Indian groups traditionally associated with the lands of Lake Mead NRA will also have an opportunity to review and comment on the EA.

The National Historic Preservation Act, as amended (NHPA), (16 USC 470 *et seq*.), NEPA, NPS Organic Act, NPS *Management Policies* (2001), DO–12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (2001), and DO–28: *Cultural Resources Management Guidelines* require the consideration of impacts on cultural resources either listed in, or eligible to be listed in, the NRHP. A report documenting the results of the pedestrian survey was submitted to the Nevada SHPO (Farrugia 2002). This fulfills the park's obligations under section 106 of the NHPA as outlined in the 1995 Programmatic Agreement among the National Park Service, Advisory Council on Historic Preservation, and the National Council of Historic Preservation Officers.

RELATED NPS PLANNING DOCUMENTS

The Rehabilitate Callville Bay Road Project complies with the primary management objectives for Lake Mead NRA as stated in the approved *General Management Plan* (GMP) (1986). These management objectives are to accommodate increasing visitor use while protecting the NRA's most outstanding natural and cultural resources. Also, the 1986 GMP specifically calls for realignment and other improvements to Callville Bay Road.

The 2002 *Lake Management Plan/Draft Environmental Impact Statement* for the management of water-based recreation within Lake Mead NRA describes and analyzes four alternatives for improving the management of Lakes Mead and Mojave to provide for the long-term protection of park resources while allowing a range of recreational opportunities for park visitors. Under the preferred alternative of the management plan (alternative C), facility expansion could occur at Callville Bay, Echo Bay, Overton Beach, and Temple Bar on Lake Mead.

ISSUES AND IMPACT TOPICS

Issues

Issues and concerns related to this proposal were identified from past planning efforts, input from park employees and concessioners, and state and federal agencies. The major issues relate to potential impacts to biotic communities, threatened and endangered species and species of concern, floodplains and water quality, air quality, soils, visitor use and experience, health and safety, and concession operations.

Derivation of Impact Topics

Specific impact topics were developed to focus discussion and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on

federal laws, regulations, executive orders; 2001 NPS *Management Policies*; NPS knowledge of special or vulnerable resources, and scoping. A brief rationale for the selection of each impact topic is given below, as is the rationale for dismissing specific topics from further consideration.

Impact Topics Selected for Detailed Analysis

Biotic Communities. NEPA calls for an examination of the impacts on all components of affected ecosystems. NPS policy is to protect the components and processes of naturally occurring biotic communities, including the natural abundance, diversity, and ecological integrity of plants and animals (NPS *Management Policies* 2001a). The proposed action has the potential to affect biotic communities, so this impact topic is addressed in the EA.

Threatened and Endangered Species and Species of Concern. The Endangered Species Act (1973) requires an examination of impacts on all federally listed threatened or endangered species. NPS policy also requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. Such species could be affected by the proposed action, so this impact topic is addressed in detail.

Floodplains and Water Quality. Executive Order 11988 (*Floodplain Management*) requires an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains. *NPS Management Policies*, DO–2 (*Planning Guidelines*), and DO–12 (*Conservation Planning, Environmental Impact Analysis, and Decision-making*) provide guidelines for proposals in floodplains. The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters, to enhance the quality of water resources, and to prevent, control, and abate water pollution. *NPS Management Policies* provides direction for the preservation, use, and quality of water in national parks. Floodplains and water quality could be affected by the proposed action, so this topic is addressed in detail in the EA.

Air Quality. The 1963 Clean Air Act, as amended (42 USC 7401 *et seq*.), requires land managers to protect air quality. Section 118 of the Clean Air Act requires parks to meet all federal, state, and local air pollution standards. *NPS Management Policies* addresses the need to analyze potential impacts to air quality during park planning. Lake Mead NRA is classified as a Class II air quality area under the Clean Air Act, as amended. The proposed action has the potential to affect air quality, so this impact topic is addressed in this document.

Soils. Because the proposed action involves ground-disturbing activities on previously undisturbed desert soil, soils are addressed as an impact topic.

Visitor Use and Experience. The Callville Bay Road terminates in the Callville Bay developed area on the shore of Lake Mead. The developed area is a popular destination for Lake Mead NRA visitors. An estimated 665,000 people visited this area in 2001. Improved roadway and parking lot circulation may provide easier access to the lakeshore, which would

improve the overall visitor experience at Callville Bay. Short-term effects to visitor experience would be expected during construction, in the form of traffic delays and longer waits in the launch area. Because construction activities would affect visitor use and experience on the Callville Bay Road and at the Callville Bay developed area, this topic is addressed in the EA.

Health and Safety. Improved roadway and parking lot circulation may decrease roadway accidents and emergency medical response time to and around Callville Bay Marina. This proposal would provide a safer traveling and recreational environment. Construction work in and around desert washes may create a risk for workers during flood periods. Therefore health and safety is addressed in this document.

Concession Operations. Improved roadway and parking lot circulation may provide easier access to the lakeshore, which would improve business at Callville Bay concessions. Short-term effects to concessions would be anticipated during construction in the form of some loss of business to the area. Concession operations are addressed as an impact topic, but other aspects of the socioeconomic environment were dismissed from detailed analysis (see below).

Impact Topics Dismissed From Detailed Analysis

Cultural Resources. Cultural resources include cultural landscapes, historic structures and districts, ethnographic resources, and archaeological resources. More than 1,500 archaeological sites are known to exist in the recreation area, but much of the area has not been surveyed. Four archaeological complexes are listed on the National Register of Historic Places (NRHP). Historic resources related to settlement, ranching, mining, exploration, and the construction of Hoover Dam are represented. The NRA also contains a variety of traditional cultural areas and sacred sites.

Archaeological Resources— The NRA cultural resource staff conducted a pedestrian survey of the project area from March 12–13, 2002 and April 16–17, 2002. No cultural resource sites were located and only two isolated finds were located (Farrugia 2002). No further work is warranted. Therefore, cultural resources are not addressed as an impact topic.

Cultural Landscapes— As described by the NPS *Cultural Resource Management Guideline* (DO–28), a cultural landscape is: "...a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions." There are no cultural landscape features identified in the immediate area of the Callville Road corridor that could be affected by current project actions; therefore, cultural landscapes was dismissed as an impact topic.

Ethnographic Resources— The National Park Service defines ethnographic resources as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally

associated with it" (DO–28, *Cultural Resource Management Guidelines*, p.191). Because no ethnographic resources are known to exist in or in proximity to the project area, ethnographic resources was dismissed as an impact topic

Historic Structures— There are no historic buildings or structures in the project area that are listed in (or eligible for listing) in the NRHP. Therefore, historic structures was dismissed as an impact topic. [Note: The Callville Road is identified later in the EA as being about 50 years old, which could potentially make it eligible for NRHP consideration as a historic structure. Presumably the historic integrity of the road (and associated ancillary structures such as culverts and guard/retaining walls) have been altered to the point that it is no longer eligible, or for other reasons the road is not considered a historic property.

As stated earlier, this project is subject to section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq*.). No cultural resources have been identified on the project corridor. The NRA has fulfilled its obligation under section 106 of the NHPA as outlined in the 1995 Programmatic Agreement among the National Park Service, Advisory Council on Historic Preservation, and the National Council of Historic Preservation Officers.

Should unknown archaeological resources be uncovered during construction, work would be halted in the discovery area and the NRA would consult, according to 36 CFR 800.11 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990.

Indian Trust Resources. Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in Lake Mead NRA. The lands comprising the NRA are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources was dismissed as an impact topic.

Wetlands. Executive Order 11990 (*Protection of Wetlands*) requires an examination of impacts to wetlands. There are no jurisdictional or NPS-defined wetlands within the project area. Therefore, wetlands were dismissed as an impact topic.

Prime and Unique Farmlands. In 1980, the CEQ directed that federal agencies assess the effects of their actions on farmland soils classified by the United States Department of Agriculture's Natural Resources Conservation Service as prime or unique. Prime or unique farmland is defined as soil, which particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. There are no prime or unique farmlands associated with the project area, so this topic was dismissed from detailed analysis.

Ecologically Critical Areas, Wild and Scenic Rivers, Other Unique Natural Areas. No areas within Lake Mead NRA have been designated as ecologically critical, nor are there any existing or potential Wild and Scenic Rivers within the NRA. Lake Mead is an important natural area, but the proposed action would not threaten the qualities and resources that make the NRA special. This topic was therefore dismissed from detailed analysis.

Environmental Justice. Executive Order 12898 (*General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)*, requires all agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. No alternative would have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's *Draft Environmental Justice Guidance* (July 1996). Environmental justice was dismissed from detailed analysis.

Park Operations. Effects on park operations from the proposed action would be negligible. Increased staff or additional equipment would not be required, nor would additional maintenance activities be required. Therefore, park operations are not addressed as an impact topic.

Soundscapes. In accordance with NPS Management Policies (2001) and DO–47, *Sound Preservation and Noise Management*, an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. Noise associated with road improvements would be short-term and localized, and activities would be scheduled so as to minimize effects on visitor experiences. The road improvements would not result in a measurable increase in traffic and associated noise. Overall effects would be negligible, so this impact topic was dismissed from detailed analysis.

Lightscapes. In accordance with NPS Management Policies (2001), the National Park Service strives to preserve natural ambient landscapes, which are natural resources, and values that exist in the absence of human-caused light. Lightscapes would not be affected by the proposed action. This topic was dismissed from detailed analysis.

Scenic Resources. In the evaluation of scenic quality, both the visual character and visual quality of a viewshed are considered. A viewshed comprises the limits of the visual environment associated with the proposed action. The park road has been in place for decades. The proposed action does not relocate or expand the road. During the construction period there would be effects due to the presence of construction equipment, but these effects would be short term and would occur within an existing developed road corridor, and

therefore, would have a negligible effect on park scenic values. This topic was dismissed from detailed analysis.

Socioeconomics. Neither the no-action or proposed action would change local or regional land use or transportation, nor would it appreciably affect local businesses outside the NRA or agencies. Implementation of the proposed action could provide a negligible beneficial impact to the economies of Boulder City, Henderson, or Las Vegas (e.g., minimal increases in employment opportunities for the construction work force and revenues for local businesses and government from construction activities and workers). Construction activities for the preferred alternative are projected to take nine months to a year. Any benefit to the economy would be temporary (lasting only during construction) and negligible overall. Therefore, most aspects of the socioeconomic environment was dismissed from detailed discussion. Concession operations (see above) was the only socioeconomic topic addressed in the EA.

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ALTERNATIVES

INTRODUCTION

This section describes a no-action and a one-action alternative for roadway improvements at Lake Mead NRA. Alternatives were developed to provide a safe and reliable roadway while preventing loss of natural and cultural resources, and improving operational efficiency, sustainability, and improved health and safety.

ALTERNATIVE A: NO-ACTION ALTERNATIVE

This alternative refers to a continuation of existing conditions without implementation of the proposed action. The no-action alternative would leave Callville Bay Road as it is today. Deficiencies include deteriorating pavement, inadequate drainage, sharp curves and steep grades, and poor circulation in the marina parking lot and around the launch. The no-action alternative does not preclude short-term, minor activities (e.g., limited safety and drainage improvements, or fixing potholes and grading shoulders) that would be part of routine maintenance for continuing operations of the existing roadway.

The area of presently disturbed land for the roadway and existing pullouts is 18.72 acres (7.56 hectares). This includes the 4-mile road surface measured from gravel shoulder to gravel shoulder.

The no-action alternative is prescribed by CEQ regulations and serves as a benchmark for comparing the management direction and environmental consequences of the preferred alternative. Should the no-action alternative be selected, the NRA would respond to future needs and conditions associated with the roadway without major actions or changes from the present course.

ALTERNATIVE B: PREFERRED ALTERNATIVE

The preferred alternative meets the project objectives of improving traffic safety on Callville Bay Road and improving circulation and safety at the Callville Bay developed area.

Roadway

This alternative refers to rehabilitation of the existing roadway starting at the intersection with Northshore Road (MP 0.0, Station 10+000) and ending at the launch ramp and marina at Callville Bay (MP 4.0, Station 16+210). It is intended to improve poor pavement conditions, rehabilitate deteriorated and inadequate drainage facilities, reduce accidents between MP 0.7 and 3.0, and improve vehicle circulation in the parking area with safe pedestrian circulation.

New traffic control and informational signs would be installed. The roadway would be widened on the existing road bench to the present average width of 32 feet (same as the Northshore Road). This width would accommodate two 12-foot wide travel lanes, and two 4-foot wide paved shoulders. Curves would be widened in the high-accident locations. Some horizontal alignment would also be adjusted to improve safety. Guardrails and additional pullouts would be added in specific locations and removed in others.

Certain segments of the road would be rehabilitated, while other segments would be reconstructed (see **Figure 4**). Rehabilitation and reconstruction would provide the conditions and service life of a new road. Rehabilitation would improve the road within the existing road alignment. It would include recycling a portion of the existing roadway surface and base; laying, leveling, and compacting this material; and applying a 3-inch asphaltic concrete overlay. Subexcavation of unsuitable subgrade material and backfill with free draining sub-base would be performed in select locations, as necessary (see **Figure 5**). Scored chatter strips, 12-inches wide, would be placed on the shoulder along and outside the fog line (painted line along the road edge). This placement would allow for a 3-foot-wide strip of smooth pavement for bicycle traffic; it is important for safety that bicyclists have a clear place to ride, away from the main travel lanes.

Reconstruction would include moving portions of the existing road onto a new alignment. This would be done to flatten or widen curves for easier negotiation and longer sight distances. New sections of road would be constructed as described above in rehabilitation. In most cases where curves would be flattened, additional cuts into slopes and fills on the down-slope side of the road would be required to achieve the necessary roadbed width (see **Figures 6 and 7**). Fill, rock, or additional topsoil would be obtained from the project area.

Proposed Pullouts

There are currently 13 pullouts along Callville Bay Road. Some of the pullouts are located on curves, creating hazards for vehicles pulling back onto the road due to poor sight distances. As part of the proposed action, six pullouts would be obliterated, either to eliminate the safety hazard or due to road realignment. Two new pullouts would be constructed. **Figure 8** illustrates the location of pullouts.

Construction Staging Area

The contractor staging area would be located on an existing paved pullout on the Northshore Road east of the Callville Bay Road intersection. Several temporary storage sites for desert soil would occupy existing pullouts, some of which would later be closed and revegetated. Aggregate and paving materials would be obtained from local sources outside the NRA.

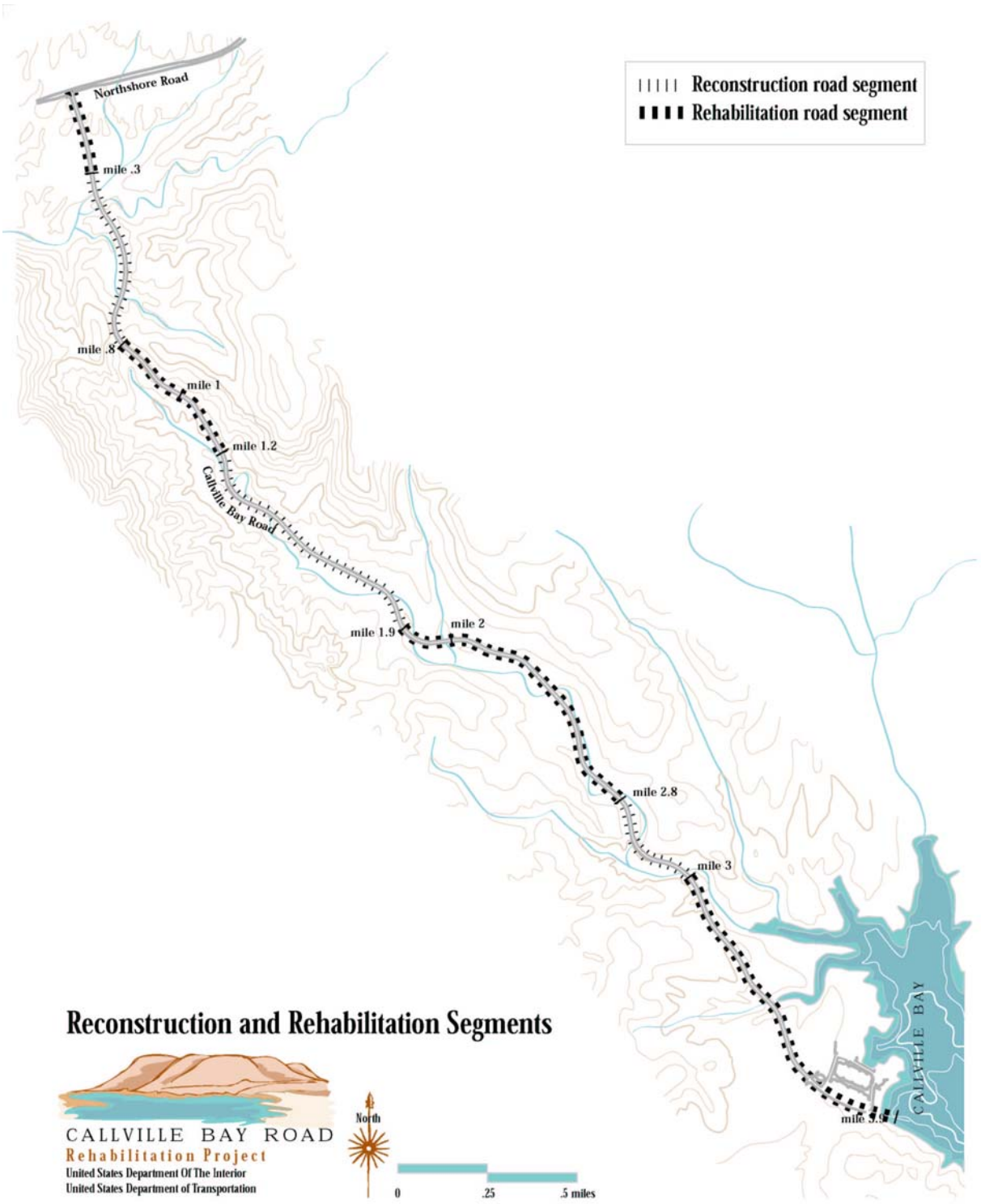

FIGURE 4. RECONSTRUCTION AND REHABILITATION SEGMENTS OF CALLVILLE BAY ROAD PROJECT

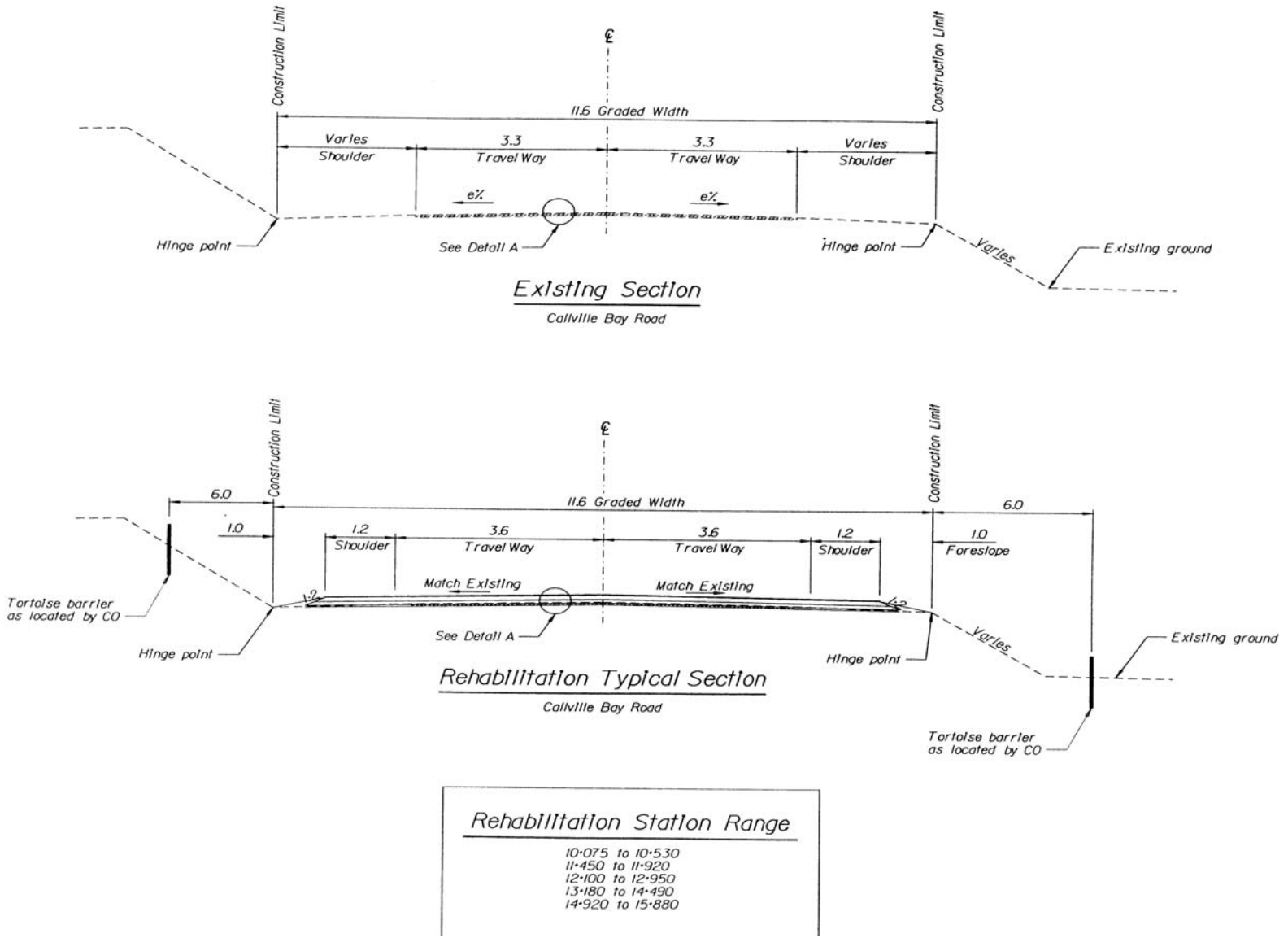

FIGURE 5. REHABILITATION CROSS SECTION

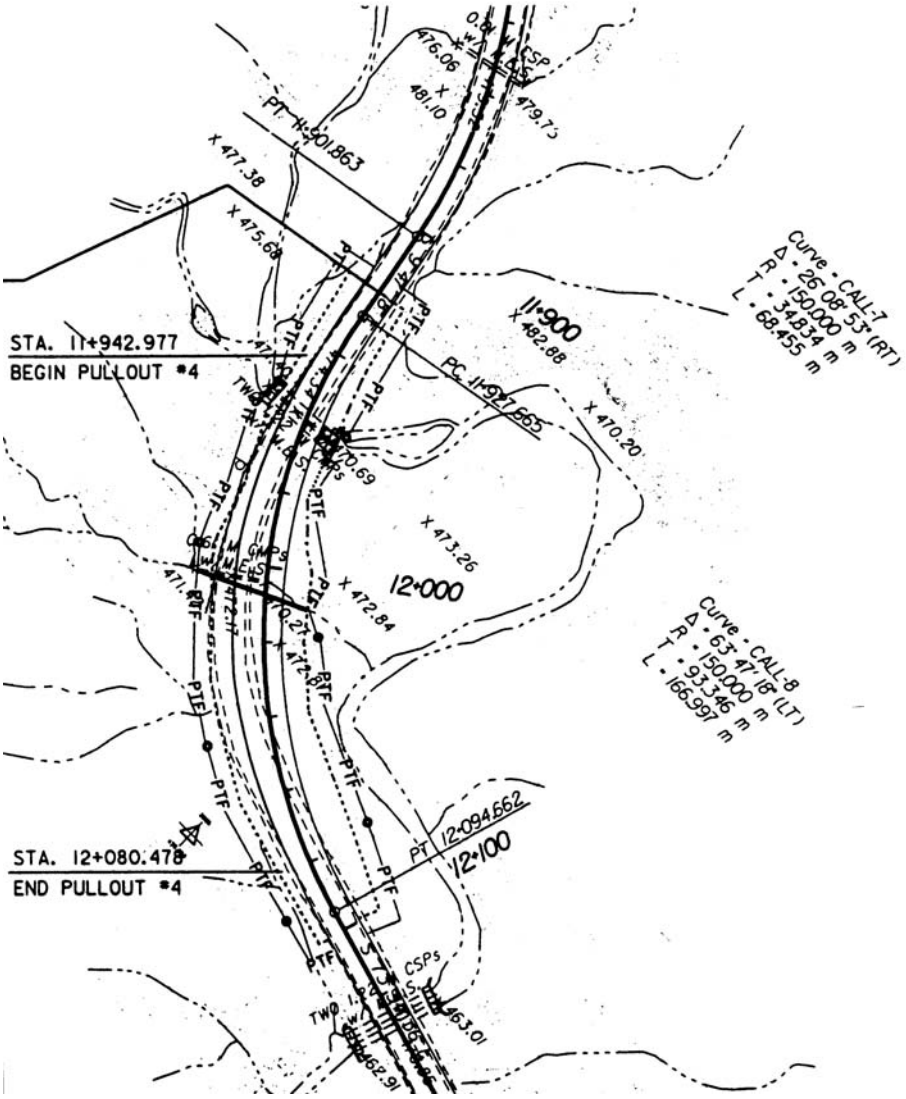

FIGURE 6. CURVE REALIGNMENT PLAN

Culverts

Thirty-four culverts, carrying flows from the large ephemeral wash and its tributaries, would require replacement, extension, and new concrete headwalls and wingwalls. Existing culverts would be replaced with 30-inch (minimum) diameter metal culverts. Additionally, placement of curb and gutter to guide runoff water would be installed at several locations. **Figure 9** illustrates the location of the culverts.

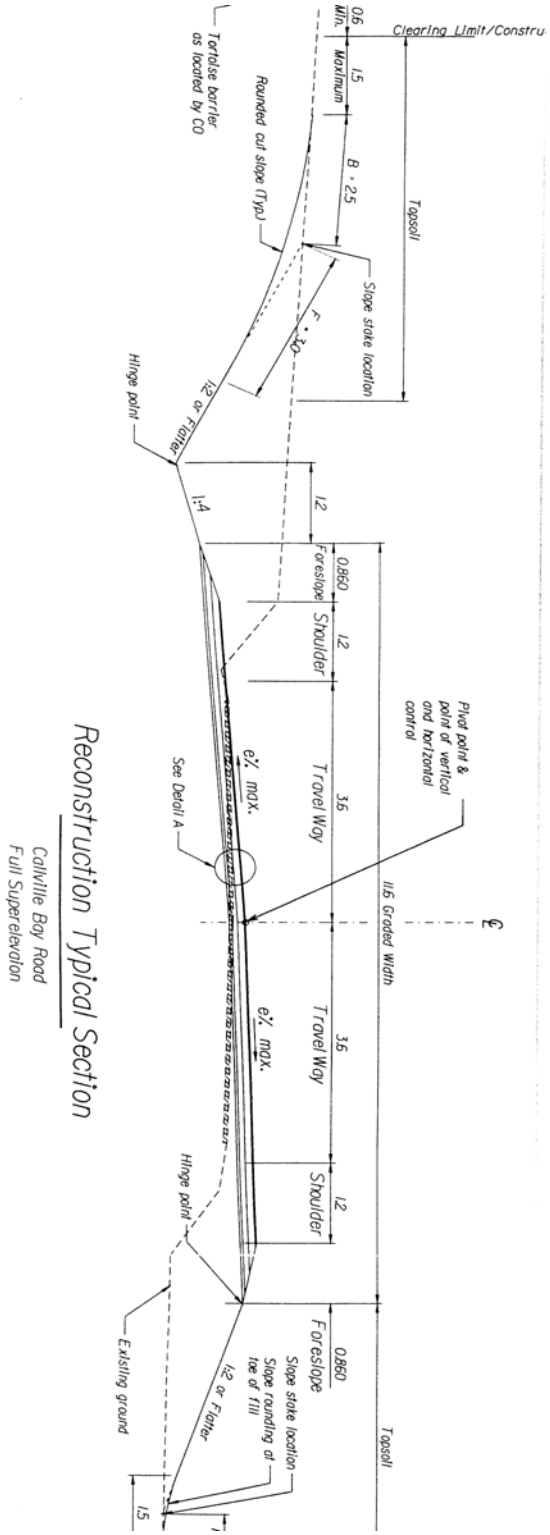

FIGURE 7. TYPICAL RECONSTRUCTION SECTION

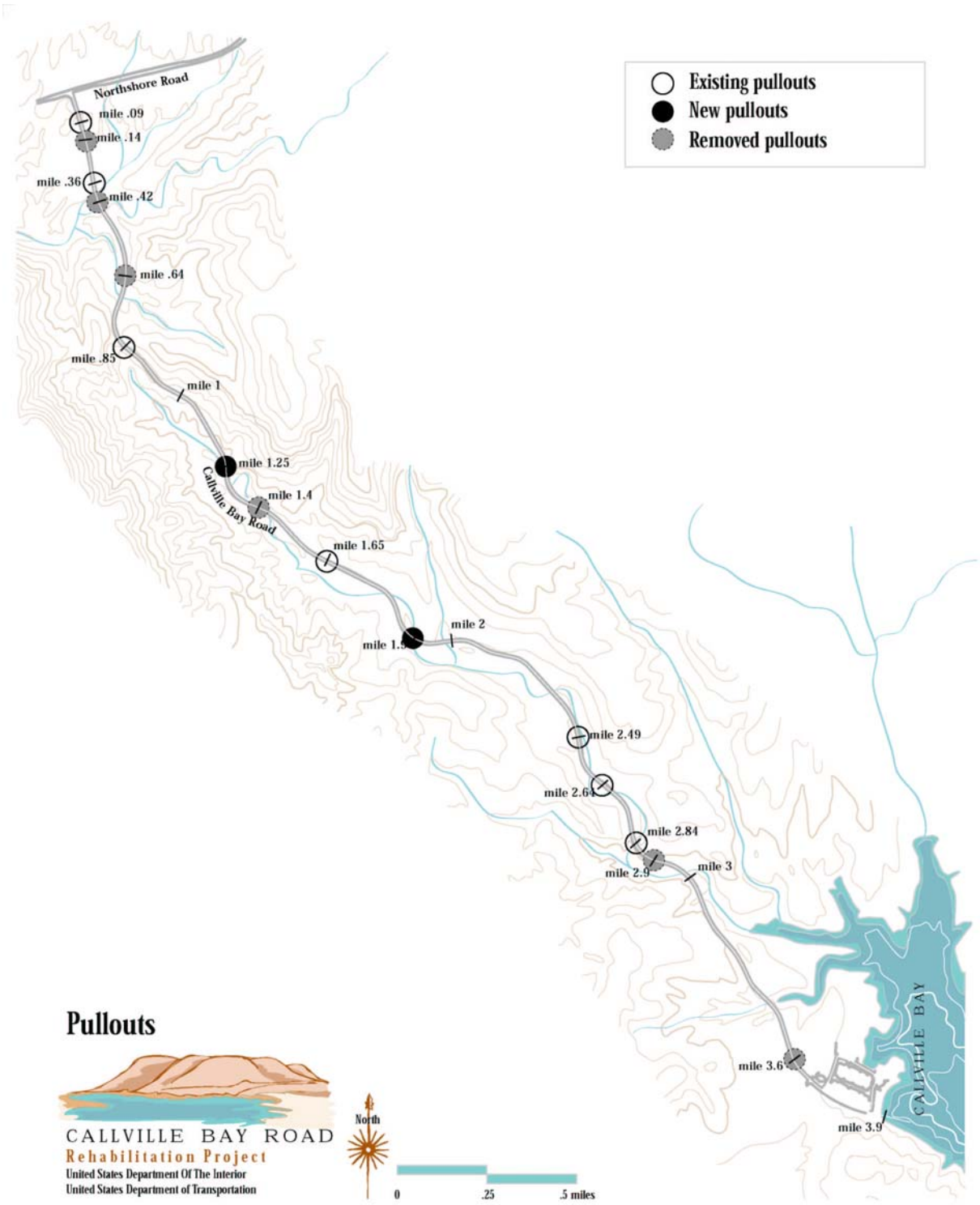

FIGURE 8. PULLOUTS ON CALLVILLE BAY ROAD

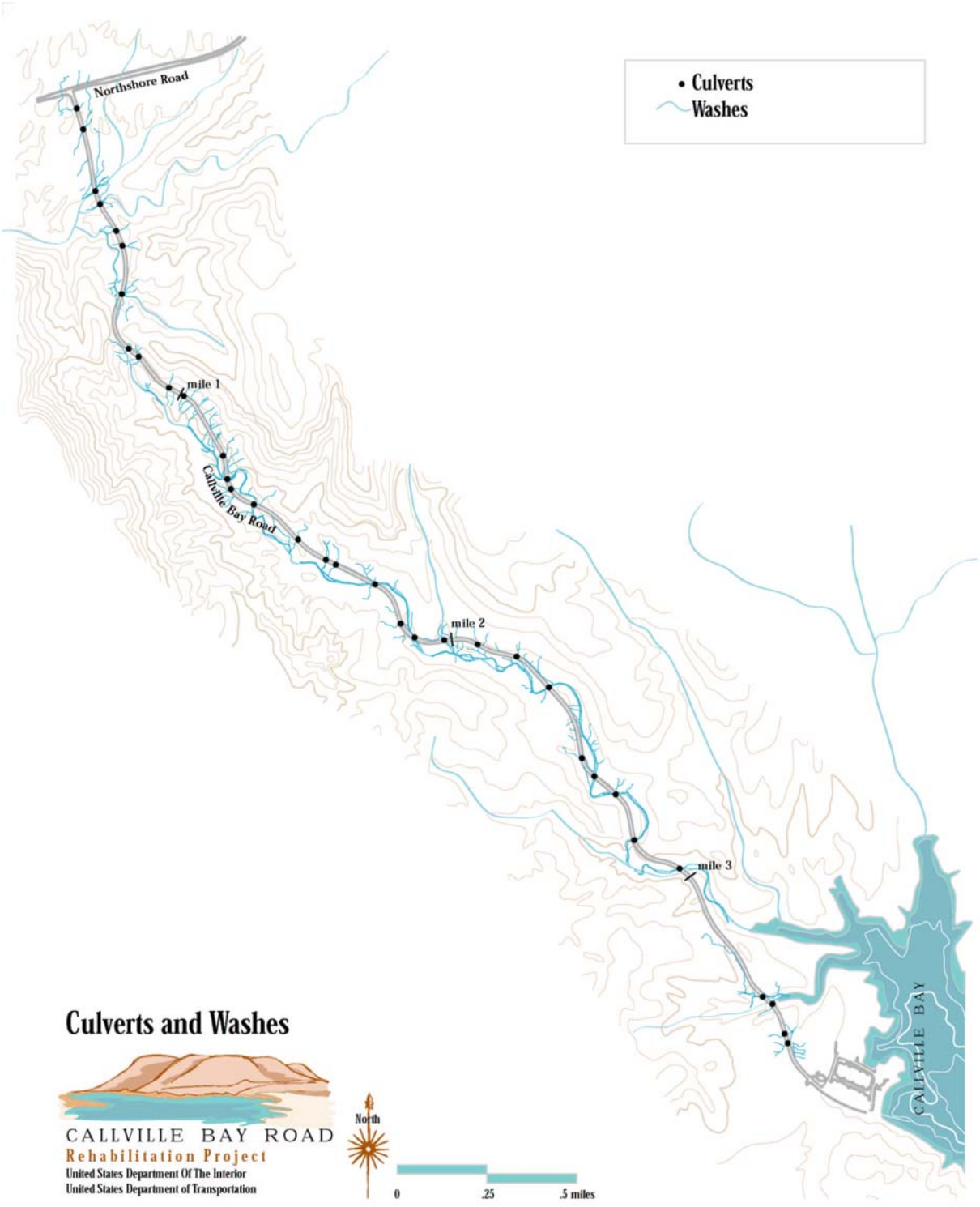

FIGURE 9. CULVERTS AND WASHES ALONG CALLVILLE BAY ROAD

Parking Lot

The parking lot would be resurfaced and re-striped to provide a two-lane stacking area and a one-way through-travel lane for emergency vehicle access and concession visitors. Larger planter islands would be installed on the east and west sides of the short-term lot to ease circulation confusion. The number of parking spaces would be 177 pull-through spaces and 131 single-vehicle spaces, which would be a net reduction of six spaces from the current configuration. The fish cleaning station would be relocated to the south of the most northern parking lot. Some utility lines would need to be relocated for the new fish cleaning station. New traffic control and informational signing would be installed. The three existing parking lots at the marina cover 17.75 acres (7.17 hectares).

General

The Callville Bay Road rehabilitation project would begin in October 2002 and is scheduled for completion by July 2003. The Callville Bay Road would remain open during construction, but traffic control would be necessary and delays of up to 15 minutes could occur. Construction would not be allowed on holiday weekends unless approved in advance by the superintendent.

MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

Mitigation

Mitigation measures were analyzed as part of the preferred action, rehabilitate Callville Bay Road. Mitigation measures discussed below have been prepared to lessen or eliminate any potential adverse effects of the proposed action.

Visitor Safety and Experience

During construction, NRA visitors would be routed away from construction areas. Barricades would be placed around construction areas to prevent visitor entry. If necessary, Callville Bay Road would be closed temporarily, for periods of no longer than 15 minutes, and signs would be posted notifying visitors of delays.

WORKER SAFETY

The potential for flash floods exists during the rainy season (between July and September) and poses a threat to workers. Therefore, the construction would likely not occur during this period. If project work is to occur between July and September, a safety plan for working in desert washes would be formulated.

Clearing and Grubbing

Construction limits would be clearly marked with ribbons and stakes prior to the beginning of ground disturbing activities. No disturbance would occur beyond these limits. Temporary construction fence would be installed where determined necessary by Federal Highway Administration and NPS project coordinators.

Scenic Resources

Callville Bay Road improvements would be limited to the minimum corridor necessary for a safe driving experience, wherever possible. Both the designs and colors of construction materials would blend with the surroundings. Rocks disturbed during construction, exposed culvert ends, and flared end sections would be treated with Permeon (or a similar approved treatment method) to match local soil colors to reduce visibility to visitors (**Figure 10**).

FIGURE 10. TREATMENT OF SOILS AND ROCKS EXPOSED ALONG THE NORTHSHORE ROAD

Water, Air Quality, and Noise

Erosion control measures would be implemented to minimize minor and short-term impacts to water quality. Sediment traps, erosion check structures, and/or filters would be considered. Best management practices (BMPs) are means of preventing or reducing nonpoint source pollution in the wash and of minimizing soil loss and sedimentation. BMPs would minimize impacts to the wash and would include all or some of the following features, depending on site-specific requirements:

- Locating waste and excess excavated materials outside the wash to avoid sedimentation;
- Prior to construction, installing silt fences, straw bale barriers, temporary earthen berms, temporary water bars, sediment traps, stone check dams, brush barriers, or other equivalent measures, including installing erosion-control measures around the perimeter of stockpiled fill material;
- Conducting regular site inspections throughout the construction period to ensure that erosion-control measures were properly installed and function effectively;
- Properly storing, using, and disposing of chemicals, fuels, and other toxic materials; and
- Refueling construction equipment in upland areas only, to prevent fuel spills near water resources.

Fugitive dust plumes would be reduced to the extent possible by using water sprinkling during earth-disturbing activities. Airborne particulates would be increased in the area of construction during the work effort and for a time following its completion. Water used during road construction would be pumped from Lake Mead, stored in a tank on the boat ramp, and hauled by truck to the construction site.

Concrete and batch plants would be located outside the NRA; however, it is expected that the contractor would use existing commercial sources of concrete and asphalt.

Contractors would be required to use state-of-the-art noise reduction technology on construction equipment to the maximum extent practicable.

Revegetation

For much of the corridor, revegetation work would not be necessary because construction would be completed in previously disturbed areas of the roadway template. Revegetation work would use desert topsoil conserved along the corridor and seeds from native species (genetic stocks originating in the NRA). Revegetation efforts would also attempt reconstruction of the natural spacing, abundance, and diversity of native plant species (**Figure 11**). No imported topsoil (desert soil) or hay bales would be used during revegetation, in an effort to avoid introduction of exotic plant species.

Undesirable species, such as tamarisk (saltcedar) (*Tamarix ramosissima*), would be controlled in high-priority areas. Other undesirable species would be monitored and control strategies initiated if these species occur. To prevent the introduction of and to minimize the spread of exotic vegetation and noxious weeds, the following measures would be implemented:

- Minimize soil disturbance;
- Pressure-wash all construction equipment before it is brought into the NRA;
- Limit vehicle parking to existing roads, parking lots, or the access route;
- Obtain all fill, rock, or additional topsoil from the project area;
- Initiate revegetation of all disturbed sites immediately following construction activities by spreading desert soil with its associated seed bank;

- Monitor all disturbed areas for two to three years following construction to identify noxious weeds or exotic vegetation. The treatment of exotic vegetation will be completed in accordance with NPS-13, *Integrated Pest Management Guidelines*. Lake Mead NRA would be developing an exotic vegetation management plan in 2003 that would address the specifics and analyze the alternatives related to the control of noxious weeds and exotic vegetation;
- Salvage and store desert soil and gypsum soils separately, and replace as close as possible to original location; and
- Obtain riprap from outside the park.

FIGURE 11. EXAMPLE OF REVEGETATION EFFORTS ALONG NORTHSHORE ROAD

Desert soil would be stored on as near its original location as possible to minimize vegetation impacts and potential compaction and erosion of bare soils. Approximately 1,160-cubic meters (1,517-cubic yards) of salvaged desert soil would be stored at the construction staging area near Northshore Road and on existing pullouts within the corridor that would be closed and restored. Replacement of desert soil would include spreading, scarification, mulching, and seeding and/or planting species native to the immediate area. Stones and disturbed bedrock along the roadside would be treated with a simulated desert varnish material such as Permeon, to reduce visual impacts related to construction. As necessary, desert soil replacement techniques would be used to re-establish desert crust surface and minimize impacts from invasive plant species, such as Russian-thistle, that would become established on disturbed sites. Previous revegetation efforts in the NRA indicate that certain exotic species (e.g., Russian-thistle) may grow from these newly placed desert soils for the first two to three years of vegetation re-establishment, then they tend to disappear.

To maximize restoration efforts after completion of construction activities, the following measures would be implemented:

- Salvage topsoil from access route construction for reuse during restoration on disturbed areas to ensure proper revegetation;
- Salvage native vegetation for subsequent replanting in the disturbed area; and
- Monitor revegetation success for three years following construction; implement remedial and control measures as needed.

Cultural Resources

Should unknown archaeological resources be uncovered during construction, work would be halted in the discovery area, the site secured, and the NRA would consult according to 36 CFR 800.11 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990. In compliance with the Native American Graves Protection and Repatriation Act of 1990, the National Park Service would also notify and consult concerned tribal representatives for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the course of the project.

Desert Tortoise

During the informal consultation process (Hendricks pers. com. 2002), three impact types were mentioned by the Service, including: 1) construction and road widening impacts, 2) impacts related to increased speed following rehabilitation of the roadway, and 3) covering over desert wash habitat and removing caliche layers and caves. Recommendations from the Service were also made during this meeting and included: 1) obtain a U.S. Army Corps of Engineers (USACE) permit for adding fill in desert washes, 2) provide desert tortoise fencing as appropriate, 3) potentially fencing other sites in the NRA where higher densities of the desert tortoise exist (possibly to the north, along Northshore Road), and 4) require desert tortoise education and monitoring for construction crews.

Mitigation measures that would be implemented to further minimize adverse effects to the desert tortoise, including habitat loss, degradation, and fragmentation; direct mortality from construction activity; and common raven predation are presented as follows:

- The clearing limits (construction limits) outside of the existing road prism would be clearly marked or flagged prior to construction. All construction activities, including staging areas, would be located within previously disturbed areas and fenced if necessary. They would be surveyed for desert tortoise presence, including burrows, prior to use. Permanent desert tortoise fence would be installed along both sides of Callville Bay Road to deter tortoises from crossing the construction zone and later the improved traffic lanes. The fence would act as a drift fence to direct desert tortoises through culverts under the road and allow access to habitat on both sides of the road.

- Use qualified and authorized biologists for all activities within the roadway corridor. A qualified NPS employee would be designated the field contact representative to oversee project compliance and coordination.

- All new culverts installed would be a minimum of 30-inches in diameter, providing adequately sized passageways for the desert tortoise.

- The project area would be surveyed by a qualified biologist for desert tortoises and their burrows and dens, immediately prior (within 24 hours) to the onset of construction in any given area. The results of the surveys would be to remove all desert tortoises currently on the project site and identify all burrows that may be avoided during construction. All desert tortoise surveys, handling of desert tortoises, and burrow excavation would be performed by a qualified or authorized biologist.

- Desert tortoise burrows found within the project area would be avoided if possible. They would be protected with desert tortoise-proof fence, placed at a minimum of 20 feet from the burrow on sides bordered by construction, to prevent crushing of underground portions of the burrow. The fencing would remain in place until construction in the vicinity was completed. Placement, inspection, and removal of fencing would occur under the direction of a qualified biologist.

- Desert tortoise burrows found within the project area that could not be avoided during construction, would be excavated by hand to determine if the burrows were occupied and to remove any desert tortoises present. All desert tortoises found within the project area, whether above ground or in excavated burrows, would be placed 300 to 1,000 feet outside of the clearing limits in the direction of undisturbed habitat. Handling and placement of desert tortoises would be performed in accordance with procedures identified in consultation with the Service. NPS biologists would be contacted to determine the best time of year for excavation of burrows and relocation of desert tortoises.

- The contractor must protect against intrusion by desert tortoises at sites with potential hazards (auger holes, steep-sided depressions, etc.).

- Construction personnel would be trained on the occurrence and status of the desert tortoise and would be advised of the potential impacts to desert tortoises and potential penalties for taking a threatened species. Following training of project staff, each trained individual would sign a completion sheet to be placed in file at the NRA.

- A litter control program would be implemented during construction to eliminate the accumulation of trash to avoid attracting common ravens that may prey on juvenile desert tortoise. Trash would be removed to trash containers following the close of each workday, and disposed outside the NRA in a sanitary landfill at the end of each work week.

- Approximately 2.1 acres of habitat disturbed by construction would be revegetated and surface reclamation of the disturbed areas would be performed to advance recovery of the habitat. At a minimum, the following measures would be considered: desert soil salvage, rocks, and plants; scarification and recontouring disturbed sites; replacement of desert soil, surface armor rock, and large rocks; seeding and planting with native species; and application of a chemical weathering agent to replicate the natural coloring of the surface layer.

- Periodic inspection and repair of the desert tortoise drift fence, including inspection of culverts to ensure they remain open and are not blocked by rocks, sediments, or debris.

- Monitoring of revegetated sites to ensure that the effort is effective and that exotic species do not become dominant.

- Ensure that the environmental education program remains active so that desert tortoise fencing and revegetation areas are not vandalized out of ignorance and that feeding of the common ravens near the boat ramp and parking lot and improper trash disposal are discouraged.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

According to CEQ regulations implementing NEPA, and the National Park Service NEPA Guidelines (DO–12, *Conservation Planning, Environmental Impact Analysis, and Decision-making*), an environmentally preferred alternative must be identified in environmental documents. In order for an alternative to be environmentally preferred, it must meet the criteria established in NPS policies and guidance documents. An alternative must meet the following criteria to be considered an environmentally preferred alternative:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The environmentally preferred alternative in this EA is alternative B, the NPS preferred alternative. This alternative was selected based on the following criteria:

- Preventing loss of natural resources (NEPA Criteria 1,3, and 4)
- Protecting public health, safety, and welfare (NEPA Criteria 2 and 3)
- Improving operations efficiency and sustainability (NEPA Criteria 1,3, and 6)
- Protecting employee safety and welfare (NEPA Criteria 3).

In short, this alternative would provide protection of public and employee health, safety, and welfare; improve day-to-day operations; and also provide protection for the threatened desert tortoise.

Sustainability

The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design NPS facilities to:

- minimize adverse effects on natural and cultural values,
- reflect their environmental setting,
- maintain and encourage biodiversity,
- construct and retrofit facilities using energy-efficient materials and building techniques,
- operate and maintain facilities to promote their sustainability, and
- illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use.

Essentially, sustainability is living within the environment with the least impact on the environment. The preferred alternative subscribes to and supports the practice of sustainable planning, design, and use of the road and associated public and administrative facilities serviced by it through mitigation, preparation, design, and materials.

PERMIT AND CONSULTATION REQUIREMENTS

No permits would be required for the no-action alternative.

Alternative B would comply with Executive Order 11988 (*Floodplain Management*) and the Fish and Wildlife Coordination Act of 1934, PL 85-624, as amended (16 USC §§ 661 – 666c). The following approvals and permits from jurisdictional agencies would be required before alternative B could be implemented:

- USACE, Nationwide or Individual Permit (as appropriate), pursuant to section 404 of the Clean Water Act, for minor discharges of dredged or fill material in waters of the United States.

- Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Water Quality Planning, Water Quality Certification, pursuant to section 401 of the Clean Water Act.

- Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Water Pollution Control, General Rolling Stock Permit for operating equipment in a body of water.

- Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Water Pollution Control, General Construction Stormwater Permit for authorization to discharge stormwater associated with construction activity under the National Pollutant Discharge Elimination System.

- Nevada SHPO – Concurrence that no historic properties will be affected and that effects from the project on historic and archaeological resources have been taken into account, in accordance with section 106 of the NHPA.

- U.S. Fish and Wildlife Service, consultation regarding threatened and endangered species, in compliance with section 7 of the Endangered Species Act of 1973, as amended.

- Clark County Health District, Air Pollution Control Division – Dust-control permit for construction activities, including surface grading and trenching.

ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

An option involving repaving of the existing roadway surface was considered for Callville Bay Road. Under this option, subsurface drainage problems would be addressed and the roadway surface replaced. Travel lane width would remain at 11 feet (3.3 m). This option was eliminated from detailed analysis because many of the vehicles traveling the road are pulling trailers and data indicates that accidents may occur when a vehicle or trailer wheel veers off the pavement onto the unpaved shoulder. Research has indicated that a 12-foot wide travel lane with 4-foot paved shoulder is necessary to ensure safety.

COMPARATIVE SUMMARY OF NO-ACTION AND PREFERRED ALTERNATIVES

TABLE 1. COMPARATIVE SUMMARY OF ALTERNATIVES

Alternative A: No-Action	Alternative B: Preferred Alternative
There would be no improvements to Callville Bay Road. Lake Mead National Recreation Area managers would respond to future roadway needs and without major actions or changes from the present course.	The existing Callville Bay Road would be rehabilitated between Northshore Road and the Callville Bay developed area to improve pavement, repair deteriorated and inadequate drainage facilities, and reduce accidents. The roadway would be widened on the existing road bench to accommodate two 12-ft. paved travel lanes plus two 4-ft. paved shoulders. Certain segments of the road would be rehabilitated and others would be reconstructed. Rehabilitation would improve the road within the existing road alignment. Reconstruction would include moving portions of the existing road onto a new alignment to flatten or widen curves to improve safety distances. Guardrails and additional pullouts would be added in some locations and removed in others. Culverts would be replaced, and curbs and gutters would be installed in several sections to guide stormwater runoff. The parking lot at Callville Bay developed area would be resurfaced and re-striped to provide a two-lane stacking area and a one-way through-travel lane for emergency vehicle access and concession visitors. Larger planter islands would be installed on the east and west sides of the short-term lot to improve circulation. The fish cleaning station would be relocated to the south of the north-most parking lot. New traffic control and informational signing would be installed.

COMPARATIVE SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

TABLE 2. COMPARATIVE SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Potential Environmental Impacts		
Impact Topic	**Alternative A: No-Action**	**Alternative B: Preferred Alternative**
Biotic Communities	No impacts to biotic communities	Road reconstruction activities would have short-term, minor, adverse impacts on plant communities and wildlife.
Threatened and Endangered Species	No impacts to threatened and endangered species	Short-term, negligible, adverse impacts to desert tortoises could result from reduced population densities, alteration of movements, egg destruction, and intentional capture and movement of vulnerable individuals. Long-term impacts to desert tortoises from installation of permanent tortoise fence would be beneficial. Short-term, negligible, adverse impacts to other species of concern could result from habitat disturbance.
Floodplains and Water Quality	No impacts to floodplains or wetlands	Road fill would locally change the form and flow dynamics of desert washes. The impact on floodplains would be minor, short-term, localized, and adverse impacts. Impacts on water quality from increased erosion and sedimentation would be short term and negligible to minor.
Air Quality	No impacts on air quality	Air quality impacts from dust and construction equipment emissions would be short term, adverse, and minor.
Soils	No impacts to soils or geology	Soils impacts from road reconstruction would be long term, localized, adverse, and minor in intensity. No unique or important geologic features would be affected.
Visitor Use and Experience	Continued minor, adverse impacts on visitor experience from maneuvering tight curves and delays in the launch ramp area	Short-term impacts on visitor use and experience would be minor and adverse if construction occurs during non-peak visitation periods, as expected. If the project extends into peak season or weekends, impacts would be moderate. Long-term impacts from road improvements would be beneficial in nature.
Health and Safety	Continued minor to moderate adverse impacts on human health and safety from driving accidents and emergency response time	Short-term health and safety impacts from reduced vehicular speed in construction zones would be beneficial. Long-term impacts would be beneficial, resulting from improved sight distances, wider travel lanes, and circulation improvements at Callville Bay developed area.
Concession Operations	No impacts on concessions	Impacts to concession operations would be short term, minor to moderate, and adverse during construction. Long-term concessions impacts would be beneficial.

COMPARATIVE SUMMARY OF POTENTIAL LONG-TERM IMPACTS

TABLE 3. COMPARATIVE SUMMARY OF POTENTIAL LONG-TERM IMPACTS

Potential Long-Term Impacts		
Impact Topic	**Alternative A: No-Action**	**Alternative B: Preferred Alternative**
Biotic Communities	None	Minor adverse
Threatened and Endangered Species	None	Beneficial
Floodplains and Water Quality	None	None
Air Quality	None	None
Soils	None	Localized, minor, adverse
Visitor Use and Experience	Minor adverse impacts	Beneficial
Health and Safety	Minor to moderate adverse impacts	Beneficial
Concession Operations	None	Beneficial

AFFECTED ENVIRONMENT

Detailed information on resources of Lake Mead NRA can be found in Lake Mead NRA's 1986 GMP and in the 1999 *Resources Management Plan*. A description of the park and resources potentially affected by the Callville Bay Road improvement project follows.

LOCATION AND GENERAL DESCRIPTION OF LAKE MEAD NRA

Lake Mead NRA is located in southern Nevada and northwestern Arizona, about 20 miles southeast of Las Vegas, Nevada. The NRA encompasses two large reservoirs (Lakes Mead and Mojave) formed by the Colorado River, which flows through Glen Canyon National Recreation Area and Grand Canyon National Park before reaching Lake Mead. The recreation area is about 1.5-million acres in size. About 60% is within the state of Arizona (Mojave County), and about 40% is within Nevada (Clark County).

Rugged mountains, deep canyons, dry washes, and sheer cliffs are typical of the landscape that surrounds Lakes Mead and Mojave. Improved access to the lakeshores is limited. Northshore Road provides access to Callville Bay, Echo Bay, and Overton Beach developed areas along the western edge of Lake Mead. Lakeshore Road is the most heavily used road in the park and provides access to the Alan Bible Visitor Center, Boulder Beach, and Las Vegas Bay developed areas on the southwestern portion of Lake Mead. The developed areas are centered around marina activities and most have concessions services for overnight visitors and day users.

Most of the NRA is arid desert. Daily summer temperatures often rise well above 100 degrees Fahrenheit (ºF). Temperatures are less extreme from October to May. Winter highs average 50ºF. Precipitation is low, averaging 3 to 5 inches annually. Most precipitation is in the form of late summer thunderstorms that can cause flash floods. Air quality is generally good, but is sometimes degraded by the coal-fired Fort Mojave steam generating plant, and airflows from the Las Vegas Basin to the west.

Park Visitation

Lake Mead NRA is considered one of the premier water-based recreation areas in the nation. Annual NRA visitation was 8.8 million people in 2001. Visitation has been relatively stable for the past five years (D. Melville pers. com. 2002). Many recreation area visitors are involved in water-based recreational activities between May and September, which are supported at the developed marina/launch ramp areas. These activities include motor boating, house boating, sailboarding and sailing, canoeing, kayaking, rafting, water-skiing, wakeboarding, fishing, swimming, SCUBA diving, use of personal watercraft, picnicking, boat touring, nature study, and camping along the lakeshore. Visitors to the NRA also participate in land-based activities, such as driving tours, hiking, and camping in NPS- or concession-operated campgrounds (NPS 2002c).

The NRA is located in one of the fastest growing regions of the United States. Los Angeles, San Diego, and San Bernardino, California are within a half-day drive, as is Phoenix, Arizona's largest metropolitan area. Many of Lake Mead's water recreation-based visitors come from southern Nevada, Arizona, southern California, and southern Utah. However, nearby Las Vegas and Laughlin, Nevada, draw people from throughout the nation as well as international visitors; many visit the NRA area while they are in the vicinity. The pressures of increasing visitation and regional population growth have created numerous challenges for the management of the recreation area and its resources.

Callville Bay is one of the closest developed recreation areas to the city of Las Vegas, and many local visitors use the facility for water-based recreation during the year. Visitation to Callville Bay has fluctuated from year to year. Over the past five years, visitation has ranged from an estimated low of 505,000 persons in 2000, to a high of 665,000 in 2001 (D. Melville pers. com. 2002). This amounts to about 8% of the NRA's annual visitation.

Park Facilities and Operations

There are six marinas and nine paved launch ramps on Lake Mead, and three marinas and four paved launch ramps on Lake Mojave (NPS 2002c). The marinas include Lake Mead, Las Vegas Bay, Callville Bay, Echo Bay, Overton Beach, and Temple Bar on Lake Mead, and Willow Beach, Cottonwood Cove, and Katherine Landing on Lake Mojave. Boat ramps are located at Hemenway, Government Wash, and South Cove on Lake Mead, and Princess Cove on Lake Mojave. A variety of services are provided at the marina areas, including boat rentals, marina slips, dry boat storage, restaurants, stores, campgrounds, and lodging facilities.

Callville Bay has a concession-operated café; lounge; marina; boat, houseboat, and personal watercraft rental facilities; boat and motor repair facilities; a trailer village; RV sites; restrooms, showers, and laundry facilities; auto and boat gas; dry boat storage; and a general store. There is also a fish cleaning station, NPS campground, NPS and concessioner housing, long- and short-term parking lots, and a launch ramp. The National Park Service also has a visitor contact station (trailer), which is operated by volunteer staff during peak summer months.

NRA staff conduct maintenance activities on Callville Bay Road, including routine and recurring work to repair or preserve the existing roadway. Routine maintenance activities include patching, applying chip-seal, striping, ditch cleaning/shaping, shoulder grading and stabilization, guardrail maintenance, and signing. There has been some repair of embankment sections where the toe of the slope is in the wash. Otherwise, there is no maintenance activity outside the existing roadway from ditch to ditch.

BIOTIC COMMUNITIES

This section describes the existing biotic environment adjacent to the Callville Bay Road corridor, and includes vegetation and wildlife (birds, mammals, reptiles, and amphibians). Threatened and endangered species and species of concern will be addressed separately in this document.

Vegetation

The Callville Bay Road corridor was constructed through sparse desert shrub and desert wash plant communities of the Mojave Desert section of the American Semi-desert and Desert Province (NatureServe 2002a). A desert shrub community consisting of the Creosote Bush – White Burrobush Shrubland Association is present and typically provides less than 5% foliar cover. This association occupies sandy desert soils from the junction of Northshore Road to the first major ridge crossing off Black Mesa (from road station 10+000 to 11+000). As Callville Bay Road dips more steeply to Lake Mead, west of station 11+100, the habitat becomes rocky, with desert varnish-stained volcanic rock dominating the landscape. White to pink-colored gypsiferous soils become common at the lower end of the road just before the boat ramp and parking lot facilities.

The Creosote Bush – White Burrobush Shrubland Association is dominated by creosote bush (*Larrea tridentata*) throughout the length of the corridor. Associated shrubs include white burrobush (*Ambrosia dumosa*), indigobush (*Psorothamnus fremontii*), beavertail cactus (*Opuntia basilaris*), cholla (*Opuntia* sp.), range ratany (*Krameria parvifolia*), and brittlebush (*Encelia farinosa*). Burrobush is more abundant on the sandy soils, beavertail cactus and cholla are more common on rocky soils, and the short-shrub desert holly (*Atriplex hymenelytra*) is common to gypsiferous soils. The herbaceous understory of these sparse shrublands include desert trumpet (*Eriogonum inflatum*), six-weeks fescue (*Festuca octoflora*), and spineflower (*Chorizanthe* sp.). One very sandy patch of soil supports the Spanish needle (*Palafoxia linearis*). All desert shrub species growing on the roadway edge and receiving additional moisture through runoff are more robust and typically in flower and fruit.

Desert washes are present in the form of a large ephemeral wash and its tributaries, which drain to Lake Mead, and three washes near Northshore Road that drain to the north of Black Mesa. One small tributary wash (approximately 5-meters wide) near Northshore Road is dominated by big galleta (*Hilaria rigida*), range ratany, threeawn (*Aristida* sp.), and Nevada ephedra (*Ephedra nevadensis*) and supports approximately 15% to 20% foliar cover. Some intermediate-sized tributary washes support white bursage, rush bebbia (*Bebbia juncea*), Nevada ephedra, and indigobush, at times reaching and exceeding 10% foliar cover. The large ephemeral wash ranges from approximately 10- to 30-meters wide and supports sparse stands and individual shrubs of Nevada ephedra, indigobush, rush bebbia, white bursage, catclaw acacia (*Acacia greggii*), and honey mesquite (*Prosopis glandulosa*).

Near the Lake Mead terminus of Callville Bay Road, the large ephemeral wash supports stands of salt-cedar (*Tamarix chinensis* (*ramosissima*)) and arrowweed (*Pluchea* (*Tessaria*) *sericea*)) at the roadway toe-of-fill. A small tributary drainage area, with a plugged culvert, is also present and the pooled water at the roadway toe-of-fill has been available in sufficient quantity to allow a decadent stand of salt-cedar to become established. Because of the sporadic water supply, this stand consists of approximately 80% dead salt-cedar stems and is revegetating to creosote bush. Salt-cedar is an exotic riparian shrub that is being actively controlled at springs within the NRA, however, not along the Lake Mead shoreline to date (Hendricks pers. com. 2002). The Nevada Weed Action Committee (2002) considers salt-cedar a noxious weed within the state.

Exotic species of ornamental plants have been introduced to the islands within the parking lots and as landscaping for dwellings and facilities. Species of palm trees, mulberry (*Morus alba*), oleander (*Nerium oleander*), juniper (*Juniperus* sp.), and Bermuda-grass (*Cynodon dactylon*), to name a few ornamentals and exotics, were noted. The tree species were planted to provide shade and to improve the aesthetics of otherwise open and exposed parking areas. Disturbed soils along the roadway support the exotic annual Russian-thistle (*Salsola pestifer*) in many locations. This species is common to disturbed soils for the first two to three years following disturbance, but has been shown to be replaced by annual and perennial native species during restoration projects in the NRA.

Wildlife

Schwartz et al. (1978) listed 10 species of amphibians, 41 species of reptiles, and 70 species of mammals as occurring or potentially occurring within the NRA.

Mammals

Of the 70 mammal species listed for the NRA, bats comprised 24% (17 species), and 37% (26 species) were considered adapted to live at the lower elevations (Schwartz et al. 1978). Common mammals that may occur along Callville Bay Road include the desert cottontail (*Sylvilagus audubonii*); black-tailed jackrabbit (*Lepus californicus*); Merriam's, Ord's, and desert kangaroo rats (*Dipodomys merriami*, *D. ordii*, and *D. deserti*); Harris and white-tailed antelope squirrels (*Ammospermophilus harrisii* and *A. leucurus*); little, Arizona, long-tailed, desert, rock, and spiny pocket mice (*Perognathus longimembris*, *P. amplus*, *P. formosus*, *P. penicillatus*, *P. intermedius*, and *P. spinatus*); cactus mouse (*Peromyscus eremicus*); and coyote (*Canis latrans*). The desert bighorn sheep (*Ovis canadensis*) is relatively common within the Callville Bay Road corridor and has caused traffic to slow or stop as visitors view or photograph them (Hendricks and Boyles per. Com. 2002). Only the coyote and antelope squirrels were observed during an early May driving and walking tour of the project area.

Reptiles and Amphibians

Amphibian species would be more common nearer to Lake Mead and the irrigated landscaping of the marina area. The desert toad (*Bufo punctatus*), Woodhouse's toad (*B. woodhousei*), leopard frog (*Rana pipiens*), and bullfrog (*R. catesbeiana*) would be the most common amphibians expected for the project area (Schwartz et al. 1978).

Reptiles, particularly lizards, were commonly observed along Callville Bay Road during a May walking survey. Those species most likely to occur in the desert environments of Callville Bay Road include the western banded gecko (*Coleonyx variegatus*), desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), collared lizard (*Crotaphytus collaris*), leopard lizard (*Crotaphytus wislizeni*), side-blotched lizard (*Uta stansburiana*), desert horned lizard (*Phrynosoma platyrhinos*), and western whiptail (*Cnemidophorus tigris*). An aquatic turtle, the spiny soft-shelled turtle (*Trionyx ferox*), is present within Lake Mead (Schwartz et al. 1978).

Birds

One of the more important bird species present within the Callville Bay Road corridor is the common raven (*Corvus corax*). The common raven is attracted to areas with human activity because of the road-killed wildlife, refuse, and litter that is generated by humans and used as a raven food source. However, common ravens also forage on the eggs and young of reptiles, including the federally threatened desert tortoise (*Gopherus agassizii*) and the eggs and young of other birds. Six common ravens were observed during an early May walking survey of this corridor—three around the parking area and fish cleaning station. A pair of common ravens was observed using a hollow in a cliff face immediately northwest of the parking area; however, it could not be determined if nesting activity was underway. Other bird species observed during the early May walking survey included the turkey vulture (*Cathartes aura*), mourning dove (*Zenaida macroura*), cliff swallow (*Hirundo pyrrhonota*), common grackle (*Quiscalus quiscula*), house sparrow (*Passer domesticus*), and European starling (*Sturnella neglecta*).

THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

Under the Endangered Species Act of 1973, as amended, an endangered species is defined as any species in danger of extinction throughout all or a significant portion of its range. There are no endangered species known for the Callville Bay Road corridor. A threatened species is defined as any species likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range. The desert tortoise is a federally threatened species that occupies habitat throughout the project region.

The Service is responsible for providing a species list of endangered, threatened, or species of concern that may be affected by a proposed federal action (USDI-FWS 2001). The species list encompassing this proposed project includes the threatened desert tortoise and the following

species of concern: chuckwalla (*Sauromalus obesus*), banded Gila monster (*Heloderma suspectum cinctum*), Las Vegas bearpoppy (*Arctomecon californica*), threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*), and sticky buckwheat (*Eriogonum viscidulum*). Two species of moss were identified by the Nevada Natural Heritage Program (NNHP) as species of concern, they are the Gold Butte moss (*Didymodon nevadensis*) and the serite crossidium (*Crossidium seriatum*) (NNHP 2002).

There is no documentation of the species of concern on or near the Callville Bay Road (NNHP 2002); however, these species are known from the project region on and in habitats similar to those along Callville Bay Road. As described in the document and in the Biological Assessment (BA) (**Appendix 3**) the road corridor provides potential habitat for all of the species of concern. There is no designated critical habitat in the vicinity of the Callville Bay Road corridor. The state of Nevada has no record of any state listed species occurring in the project area.

Reptiles

The desert tortoise and the species of concern have been addressed fully in the appended BA, prepared by the NRA for the Service (a summary of the BA is included in **Appendix 3**). Only brief descriptions of each species are presented below to provide understanding for this EA.

Desert tortoises are distributed from southeastern California, southern Nevada, and extreme southwestern Utah, through western and southern Arizona and northern Mexico (NatureServe 2002c, Boyles 1998). They are predominantly herbivorous and a semifossorial (burrowing) inhabitants of warm upland plateaus and mountain slopes in the Mojave Desert. Desert tortoises occupy creosote bush scrub and the creosote bush–white burrobush community. The native grass, big galleta, is often present where the desert tortoise is most abundant. In general, desert tortoises forage primarily on native winter and summer annual plants (dicots and grasses), perennial grasses, cacti, and perennial shrubs in descending order of preference. Insects, caterpillars, and other insect larvae may also be eaten, and desert tortoises have been observed biting road-killed anurans and lizards (Grant 1936, Brown 1968, Okamoto 1995 in NatureServe 2002c). It has been suggested that an active adult desert tortoise requires about 45 lbs (21 kg) of herbaceous forage per month (NatureServe 2002c).

During the 1970s it was apparent that desert tortoise populations were declining throughout a significant portion of their range. Many factors have been implicated, including: 1) land development, 2) off-road vehicle travel, 3) poaching and vandalism (including shooting), 4) disease (especially upper respiratory tract disease caused by a mycoplasma), 5) overgrazing by livestock, burro, and horse, 6) habitat degradation due to exotic plant invasion, 7) range fires fueled by exotic annual grasses and forbs, 8) energy and mineral development, 9) road and highway traffic/collisions, 10) trail construction, 11) collecting, 12) predation by the common raven, coyote, feral dogs and cats (associated with human garbage dumps and backyard feedings), 13) release of non-native desert tortoises into areas occupied by native populations, and 14) natural droughts (resulting in poor nutrition and immunocompromise) (Oldemyer 1994, USFWS 1990, Jacobson et al. 1995, CDF&G 1990, Berry 1992 in

NatureServe 2002c and Boyles 1998). The desert tortoise was listed as threatened under Service listing procedures during 1990 (USFWS 1990).

Desert tortoises have been observed historically in the area of Callville Bay and Northshore Roads during inventory and research efforts; they were considered widespread but in small numbers throughout the NRA, below about 4,000-feet elevation (Schwartz et al. 1978). The Northshore portion of the NRA was surveyed during 1995 through 1997, and was determined to have higher densities of desert tortoise than most other areas of the NRA (Boyles 1998, Boyles 2002). A 1.0 km^2 plot on Government Wash, within five miles of the Callville Bay Road corridor, yielded observations of nine live desert tortoises (two years), seven sites with tortoise remains, and 86 burrows (Boyles 1998). The Callville Bay Road corridor was surveyed for sign of desert tortoise on 29 March 2002 by the NRA wildlife biologist and assistants (Boyles 2002, Boyles pers. com. 2002). No desert tortoise sign (individuals, burrows, dens, scat, old carapaces and bones, etc.) was observed. Observations made from this survey were: 1) the project corridor is located in occupied desert tortoise habitat, 2) habitat quality along the road is marginal, 3) habitat quality improves with increasing distance from the roadway and increasing distance from Lake Mead, 4) there are NRA records of the desert tortoise being observed on the Callville Bay Road, and 5) to prevent desert tortoise mortalities, the project corridor should be fenced and all the ground surveyed for desert tortoise immediately prior to construction activity.

Chuckwallas are present in southern Nevada, southern Utah, southeastern California, western Arizona, southern Baja California, and west-central Sonora. The species is considered widespread and common in California and much of Arizona; however, Nevada ranked the chuckwalla status undetermined due to lack of information or substantially conflicting information about status or trends (NatureServe 2002d). The greatest threats to the chuckwalla are excessive collecting and habitat destruction, including habitat damage resulting from collecting, where rocks are overturned and fissures and exfoliations are broken open.

Chuckwallas prefer rocky desert, lava flows, hillsides, and rock outcrops, where they can bask on rocks and take shelter in rock crevices. Chuckwalla range is characterized by creosote bush and this herbivore browses on a wide variety of leaves, buds, flowers, and fruit (of various plant species), in addition to occasional insects (NatureServe 2002d).

Banded Gila monsters are present in the Mojave Desert of Nevada, Arizona, and California. Little is known about the subspecies; however, it occupies Mojave desert scrub and desert grassland, typically in rocky areas (NatureServe 2002e). This large lizard may spend over 95% of its time underground or under cover of some type. The diet of banded Gila monsters consists of small mammals, eggs of ground-nesting birds and other reptiles, lizards, insects, and carrion. The subspecies can transmit a poison about as toxic as that of the western diamondback rattlesnake (*Crotalus atrox*), but must do so through a bite with chewing action.

Vegetation

The Las Vegas bearpoppy is typically found on gypsiferous soils in desert shrub communities. The habitat consists of open, dry, spongy or powdery, often dissected badlands; hummocked

soils with high gypsum content, often with well-developed soil crust; in areas of generally low relief on all aspects and slopes; and associated with a sparse cover of creosote bush, saltbush, and blackbrush associations (NNHP 2001). It is a perennial forb that forms rounded clumps and produces a yellow flower (NNHP 2001; Welsh et al. 1993).

Threecorner milkvetch plants occupy sandy to fine-textured soil in mixed desert shrub communities. Specifically, the habitat is described as open, deep sandy soil or dunes, generally stabilized by vegetation and/or a gravel veneer (NNHP 2001). It is an annual forb with purple or pink-purple flowers that bloom in the spring.

The sticky buckwheat occupies desert wash, sand flats, roadsides, and deep sands with mesquite, creosote bush, white bursage, and indigobush, among several other shrub species (NatureServe 2002f, NNHP 2001). Sticky buckwheat was also reported growing with saltcedar and arrowweed in some sandy desert washes. It is an annual forb with small yellow flowers and blooms in April and May. The stems and branches are slightly sticky and are often covered with adhering sand particles.

There may be habitat for two state-listed mosses—Gold Butte moss and seriate crossidium. Gold Butte moss is confined to gypsum soil formations that occur along the north shore of Lake Mead. This species can be identified in the field by its twisted leaves when seen under a hand magnifying lens, along with the lime green coloration when wet, and tan coloration when dry. Seriate crossidium is a low desert species normally restricted to sandstone and gypsum soils and associated with Gold Butte moss. This species is extremely small, and difficult to identify in the field. It grows in clumps in exposed soil or in the shadow on the north side of shrubs like Mormon tea. The moss is bisexual, but does not normally produce fruit. Globally known from less than ten populations, with perhaps the most numerous populations in Nevada in the region north of Lake Mead (Stark and Shevock 2002).

FLOODPLAINS AND WATER QUALITY

Callville Bay Road crosses numerous small desert washes and a large wash several times over its 4.0-mile (6.0 km) reach. The washes eventually drain into the Boulder Basin portion of Lake Mead. The washes are typically dry, but they occasionally experience flash flooding during thunderstorms in July, August, and early September. Where the road crosses the washes, medium-to-large diameter culverts allow water to pass under the road and continue flowing down the wash.

Lake Mead is the source of drinking water for millions of people downstream. Other major values of the lake include an environment for aquatic organisms, and for recreational uses such as swimming, water skiing, windsurfing, fishing, and boating. Lake Mead waters typically meet state drinking water quality standards, although there is occasional degradation near harbors, high-use coves, and where perennial streams enter the lake.

The *Lake Mead National Recreation Area Resource Management Plan* (1999) identifies internal threats to water resources, including heavy recreation use in coves (from excrement

and litter) and water quality in harbors (from illegal sewage discharge and petrochemical spills). External threats include materials transported to the lake by tributaries such as Las Vegas Wash and the Colorado River, air pollutants dropping into the lakes, and adjacent land uses and increasing development.

Water quality concerns for Lake Mead generally center around chemical and biological pollutants such as petrochemicals and bacteria associated with human waste. Turbidity (water cloudiness) and sedimentation have not been major concerns thus far. The washes in the project area are ephemeral and water quality data are not available for them.

AIR QUALITY

Lake Mead NRA is designated a Class II air quality area under the Clean Air Act. Air quality within the region is generally good, but some degradation of air quality occurs in lower elevations of the recreation area. Air pollutants come primarily from outside the park and can concentrate in the park, especially during periods of atmospheric inversion. Major sources of air pollutants within or adjacent to the recreation area include: the Mojave generating plant near Laughlin, Nevada; emissions from motor vehicles from the Las Vegas valley and other urban areas; gravel and gypsum quarries; fugitive dust from disturbed lands and construction activities; and other power generating plants in the region. Air quality regulations within the project area, including Clean Air Act regulations, are administered by the Clark County (Nevada) Air Pollution Control Division (NPS 2001c).

The recreation area has spectacular vistas and scenic areas around both Lakes Mead and Mojave, but degraded air quality sometimes causes visible smog. Preserving air quality is integral to providing high quality recreational experiences.

SOILS

Callville Bay Road lies on the southeastern slope of Black Mesa and crosses a large ephemeral wash and its tributaries several times before it reaches Lake Mead. Black Mesa contains many volcanic rocks that are light gray in color, but have developed a black “desert varnish” from exposure to the arid environment. The rocks range in size from boulders to cobble.

The desert soils are shallow, gray, have a high salt content, and are underlain by caliche hardpans. These soils have been described as lithosols (NPS 1986). The soil surface in portions of the project area consists of desert pavement in which the surface fines have been removed by the action of wind and water. The rocks that remain help to armor the surface, limiting additional erosion.

Some exposures of gypsiferous soils also occur; these are grayish-white to red in color. Soils of the desert washes are alluvially-deposited sands, gravels, and some boulders.

In areas that have been disturbed by construction and grading, soil fines deposited on the surface during construction are subject to erosion and colonization by various weed species like the Russian thistle. Loss of topsoil and fines occurs until wind and water erode the fines from the surface and the site is "re-armored." This process takes years, although periodic storms may remove significant amounts of soil in a short period of time.

VISITOR USE AND EXPERIENCE

An analysis of recreational use of Lake Mead NRA was conducted between Memorial Day 1993 and Labor Day 1994 (NPS *Lake Management Plan 2002*). This study illustrated that the Boulder Basin area of Lake Mead and the Katherine area of Lake Mojave are consistently the two busiest developed areas in the recreation area. Callville Bay receives 8% of annual visitation (about 665,000 people or 201,500 vehicles per year) (Melville pers. com. 2002).

TABLE 4. TRAFFIC COUNTS FOR CALLVILLE BAY ROAD BY MONTH FOR 2001

Month	Count	Month	Count	Month	Count
January	3,231	May	20,786	September	27,810
February	8,535	June	31,811	October	15,000
March	18,232	July	19,689	November	3,030
April	18,772	August	26,966	December	5,000

Traffic studies by vehicle type have not been conducted, but Callville Bay Marina staff have observed that most traffic consists of pickup trucks pulling boat trailers. This is further supported by the fact that 80% of vessels at the NRA are runabouts (less than 24 feet) or personal watercraft (NPS 2002c). Most trailers are one-to-three axles, with boats18- to 32-feet in length. Tractor-trailer rigs transport larger boats (up to 75-feet in length with 3 decks) for launch and retrieval. About 20 houseboats are bought and sold and transported in or out of the marina per year, generally during the off-peak season (J. Gomes pers. com. 2002). At any given time, there are up to 50 boats in the marina from 56- to 65-feet in length (R. Carnes pers. com. 2002).

Impacts on visitor experience that are monitored throughout the park by the National Park Service include visitor satisfaction, boating accidents, traffic circulation, waiting time to launch, launch ramp parking lot capacity, empty slips in the marinas, boat distribution, quality of recreational facilities, and visitor exposure to flood hazards.

Callville Bay has 13 launch lanes with a capacity of 576 launches per day (this number assumes 8 launches per hour, 12 hours of daylight, with 50% launches and 50% retrievals) (*National Park Service Management Plan* 2002). Callville Bay also has 333 pull-through parking spaces. Currently, due to low water levels, waits for launching can reach 75 minutes during busy periods, with vehicles stacked a half-mile up Callville Bay Road (D. Melville pers. com. 2002).

Other uses for Callville Bay Road are wildlife watching and fishing tournaments. Callville Bay is the most heavily used marina area for fishing tournaments. Visitors also use road pullouts to view bighorn sheep along the roadway.

HEALTH AND SAFETY

In 1995, the National Park Service conducted a Traffic Safety Program Review for roads within Lake Mead NRA (Robert Peccia and Associates, Inc. 1995). As the primary means of analyzing accident data, overall accident rates for major road segments were developed. Accident rates were expressed as the number of accidents per million vehicle-miles traveled (ACC/MVMT). For Callville Bay Road, the number of accidents between 01 January 1990 through 31 December 1993, was 36, resulting in the fourth-highest number of accidents for a road segment within the NRA. Factoring in the length of the road, the accident rate was 12.38 ACC/MVMT, ranking it the second-highest in the NRA.

The 36 accidents included one fatal accident resulting in two deaths, six injury accidents producing eight injuries, and 29 property damage only accidents. The most apparent problem on Callville Bay Road is that motorists bound for the lake often travel at excessive speeds. This is a particular problem for vehicles with trailers. Motorists heading downgrade too fast may have difficulty negotiating curves on the route. Recommendations in the report included reconstruction to 32-foot wide including travel lanes and paved shoulders (Robert Peccia and Associates, Inc. 1995).

During the summer months, recreational accidents occur frequently and emergency personnel are called to Callville Bay once or twice every week. The current parking lot configuration delays response time, especially on the weekends when the parking lot is busiest (J. Gomes pers. com. 2002).

Another aspect of safety is flash flooding in desert washes. Most precipitation falls during intense thunderstorms from July through early September. The National Park Service produced a series of “Flood Hazard Studies” (NPS 1986) that analyzed 100-year and probable maximum floodplains. Major developed areas were analyzed in these studies. The calculations for flash-flood flow take into consideration the rate of precipitation, size of drainage, time of flood concentration, length of drainage, change in elevation within the drainage, duration of precipitation, and amount of runoff after absorption in the soil. These studies concluded that Callville Bay does not have flood hazards (NPS 1986) associated with potential loss or damage to facilities. However, risk of injury or death to people in the desert wash from flash floods exists.

CONCESSION OPERATIONS

Lake Mead NRA is a valuable resource, contributing to the local economy through the sale and rental of boats and other water-related equipment, camping and other recreational equipment, as well as services and maintenance, hotels, restaurants, and travel-related services. The in-park concession operations at Lake Mead NRA collectively gross $45 million (NPS 2002c). Concessions operations that might be affected by the proposed action include Callville Bay, and indirectly, the concession operators at nearby facilities. The Callville Bay concession grosses over $9 million per year (J. Gomes pers. com. 2002).

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section describes the environmental consequences of the no-action and the preferred alternatives. First the methods for assessing environmental consequences are discussed. NEPA requires consideration of context, intensity, and duration of impacts, cumulative impacts, and measures to mitigate impacts. Next is an explanation of resource "impairment," which must also be assessed by alternative, according to NPS policy. Subsequent sections in this chapter are organized by impact topic, first for the no-action alternative, then for the NPS preferred alternative.

METHODS FOR ASSESSING IMPACTS

Impact analyses and conclusions are based on the review of existing literature and park studies; information provided by park staff; professional judgments and insights of other agencies and officials; and input from interested local tribes and the public. Definitions used to evaluate the context, intensity, duration, and cumulative nature of impacts associated with project alternatives are discussed below. Environmental consequences are evaluated based on the adoption of the mitigation measures outlined in the Alternatives section of this document.

Context is the setting within which impacts are analyzed such as the affected region, society as a whole, the affected interests, and/or a locality. In this EA, the intensity of impacts are evaluated within a local (i.e., project area) context, while the intensity of the contribution of effects to cumulative impacts are evaluated in a regional context.

Duration is the time period for which the impacts are evident. Short-term impacts are those that are noticeable during the project and six months thereafter. Long-term impacts are those that are evident for periods longer than six months after the project.

For this analysis, *impact intensity* or severity is defined as follows:

Biotic Communities and Species of Concern

- Negligible – an action that could affect biotic communities or species of concern habitat, but the change would be so small that it would not be of any measurable or perceptible consequence.
- Minor – an action that could affect biotic communities or species of concern habitat, but the change would be slight and localized with few measurable consequences.
- Moderate – an action that would result in readily apparent changes to affect biotic communities or species of concern habitat with measurable consequences.

- Major – a severely adverse effect to biotic communities or species of concern habitat would result.

Threatened and Endangered Species

- No effect – When the alternative would not affect the species or its habitat.
- Not likely to adversely effect – Extremely unlikely to occur and is not able to be meaningfully measured, detected, or evaluated (or completely beneficial).
- Likely to adversely effect – Any adverse effect to the species that may occur as a direct or indirect result of the alternative and the effect is not discountable or completely beneficial.

Floodplains and Water Quality

- Negligible – an action that could change water quality or floodplain characteristics, but the change would be so small that it would not be of any measurable or perceptible consequence.
- Minor – an action that could change water quality or floodplain characteristics, but the change would be slight and localized with few measurable consequences.
- Moderate – an action that would result in readily apparent changes in water quality or floodplain characteristics with measurable consequences.
- Major – a severely adverse change in water quality or floodplain characteristics.

Air Quality

- Negligible – an action that could change air quality, but the change would be so small that it would not be of any measurable or perceptible consequence.
- Minor – an action that could change air quality, but the change would be slight and localized with few measurable consequences.
- Moderate – an action that would result in readily apparent changes in air quality with measurable consequences.
- Major – a severely adverse change in air quality would result.

Soils

- Negligible – an action that could cause change in soil and geology, but the change would be so small that it would not be of any measurable or perceptible consequence.
- Minor – an action that could change soil and geology, but the change would be slight and localized with few measurable consequences.
- Moderate – an action that would result in readily apparent changes to soil and geology with measurable consequences.
- Major – a severely adverse change to soil and geology would result.

Visitor Use and Experience

- Negligible – the impact is barely detectable and/or will affect few visitors.
- Minor – the impact is slight, but detectable, and/or will affect some visitors.
- Moderate – the impact is readily apparent and/or will affect many visitors.
- Major – the impact is severely adverse and/or will affect the majority of visitors.

Health and Safety

- Negligible – an action that could affect human health and safety, but the change would be so small that it would not be of any measurable or perceptible consequence and/or would affect few people.
- Minor – an action that could affect human health and safety, but the change would be slight and localized with few measurable consequences and/or would affect some people.
- Moderate – an action that would result in readily apparent changes to human health and safety with measurable consequences and/or would affect many people.
- Major – a severely adverse effect to human health and safety would result and/or would affect the majority of people.

Concession Operations

- Negligible – an action that could change economic conditions, but the change would be so small that it would not be of any measurable or perceptible consequence.
- Minor – an action that could change economic conditions, but the change would be slight and localized with few measurable consequences.
- Moderate – an action that would result in readily apparent changes to economic conditions with measurable consequences.
- Major – a severely adverse change to economic conditions would result.

The *duration* of the impacts in this analysis is defined as follows:

Short term – impacts occur only during construction or last less than one year
Long term – impacts last longer than one year

Cumulative Impacts.

CEQ regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7)." Cumulative impacts are considered for both the no-action and preferred alternative.

Cumulative impacts were determined by combining the impacts of the preferred alternative (rehabilitating and reconstructing Callville Bay Road) with other past, present, or reasonably foreseeable future actions. It was therefore necessary to identify major past, ongoing, or reasonably foreseeable future actions affecting the NRA.

Actions having the potential to cumulatively affect resources include population growth and associated land-use changes on a regional level, recreational development within the NRA, transportation improvements within the NRA, water quality improvement projects, threatened and endangered species protection initiatives and programs, and reduced lake water levels.

IMPAIRMENT OF PARK RESOURCES AND VALUES

In addition to determining the environmental consequences of the proposed action and alternatives, the 2001 NPS *Management Policies* and DO–12 (*Conservation Planning, Environmental Impact Analysis, and Decision-making)* require analysis of potential effects to determine if actions would impair park resources. The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must seek ways to avoid, or minimize to the greatest degree practicable, adversely impacting park resources and values. Congress has given NPS managers discretion, however, to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values.

The prohibited impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources or values. An impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- Necessary to fulfill specific park purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park;
- Identified as a goal in the park's GMP or other relevant NPS planning documents; and

A determination on impairment is made in the "Conclusion" section of all natural resource impact topics of this document. Impairment statements are not required for recreational values/visitor experience or health and safety topics.

ENVIRONMENTAL CONSEQUENCES — ALTERNATIVE A: NO-ACTION

Biotic Communities

Alternative A would result in no change to direct or indirect impacts on biotic communities associated with the existing Callville Bay Road because there would be no construction activities. The existing level of impact related to wildlife/vehicle collisions would continue into the future. Impacts to the threatened desert tortoise and species of concern are presented below.

Cumulative Impacts. The no-action alternative is not expected to contribute to cumulative effects on biotic communities or wildlife along the existing roadway.

Conclusion. There would be no change to impacts on biotic communities or wildlife resulting from the no-action alternative. There would be no cumulative impacts to biotic communities from the no-action alternative. There would be no impairment to biotic communities under the no-action alternative

Threatened and Endangered Species, and Species of Concern

Because no action would be taken in this alternative, there would be no change in effects to the desert tortoise population adjacent to the existing Callville Bay Road. The area adjacent to the road appears to be uninhabited and abandoned habitat for the desert tortoise. The road is approximately 50 years old and even modest rates of road kills along it could have depressed any adjacent desert tortoise populations. The roadway may also be restricting movement and gene flow between populations on either side, although it is likely that desert tortoises occasionally successfully cross the road or travel under it through culverts, and some genetic exchange occurs. Individual tortoises would continue to be subject to vehicle collision or predation.

The chuckwalla may use the rocky desert, lava rocks, and rock outcrops adjacent to Callville Bay Road for habitat. Chuckwallas would be expected to be more mobile than the desert tortoise and less restricted in moving across the roadway to colonize or breed. The banded Gila monster may use the Mojave Desert scrub, desert grassland, and rocky areas adjacent to the roadway for habitat. Banded Gila monsters would be expected to be more mobile than the desert tortoise and less restricted in moving across the roadway to colonize or breed.

Gypsiferous soils present within the road corridor and vicinity could support the Las Vegas bearpoppy, Gold Butte moss, and seriate crossidium moss. Fine-textured soils of the mixed desert shrub communities, particularly deep, sandy soils stabilized by vegetation or a gravel veneer could support the threecorner milkvetch. Further, these same soils and the sandy soils of desert washes, sand flats, deep sands, and the roadside throughout the corridor could provide habitat for the sticky buckwheat. It is not known if these species occur in the project area; however, continual roadside maintenance would reduce reproductive success of species

directly adjacent to the roadway. For species of concern, there would be no change in effects under this alternative.

Cumulative Impacts. There are plans for additional road improvement projects in the NRA. The surrounding lands are located within the natural environment or environmental protection subzones, which emphasize conservation of natural resources and provide for environmentally compatible recreational activities. The no-action alternative would not contribute to cumulative effects on threatened and endangered species and species of concern along the existing roadway.

The project site occupies desert tortoise habitat and potential habitat for the chuckwalla, banded Gila monster, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, Gold Butte moss, and seriate crossidium moss east of the city of Las Vegas, in Clark County. The development of private land in the vicinity of Las Vegas and its suburbs, and the associated loss and degradation of desert tortoise habitat and habitat for the species of concern is expected to continue into the future. Actions on private lands such as urban development, recreation, and grazing would continue to contribute to habitat degradation and loss for all biotic species.

The Service issued an incidental take permit pursuant to section 10(a)(1)(B) of the Endangered Species Act to Clark County and the cities of Las Vegas, North Las Vegas, Henderson, and Boulder City (24 July 1991). This permit authorizes incidental take of desert tortoises on non-federal land in the permit boundaries. When reviewed within the regional expanse of Clark County and the geographical extent of the Mojave Desert habitat available for the desert tortoise population, the impact to desert tortoise along the Callville Bay Road would be small. The cumulative effect of the no-action alternative to the desert tortoise would be small relative to regional effects outside the NRA and would be long-term, negligible, and adverse. The cumulative effect of the no-action alternative to species of concern, e.g., the chuckwalla, banded Gila monster, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, Gold Butte moss, and seriate crossidium moss would be long-term, negligible, and adverse relative to regional effects outside the NRA and confined to maintained areas of soil.

Conclusion. The no-action alternative would not change effects on the desert tortoise, chuckwalla, and banded Gila monster from vehicle collision, habitat fragmentation, and predation from predators (including the common raven) along the road corridor. The habitat in the road vicinity appears to be uninhabited and abandoned habitat for the desert tortoise, and 50 years of road use could have depressed any adjacent desert tortoise populations.

Cumulative impacts to threatened and endangered species and species of concern would be long-term, adverse, and negligible. Cumulative impacts to the Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, Gold Butte moss, and seriate crossidium moss would be long-term, adverse, and negligible. The potential habitat available for the chuckwalla, banded Gila monster, Gold Butte moss, and seriate crossidium moss would remain unchanged due to road maintenance activities. The Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat may be affected by on-going road maintenance activity and

off-pavement travel of vehicles and trailers, if these species have become established on the road shoulder.

There would be no impairment of threatened and endangered species or species of concern under this alternative.

Floodplains and Water Quality

Because no action would be taken in this alternative, there would be no change to direct or indirect impacts on floodplains or water quality as a result of the no-action alternative.

Callville Bay Road would continue to have minor localized impacts on desert wash flood hydrology due to floodplain alterations from road fill. Eroding road edges and slopes within the project area would continue to have minor localized effects on water quality resulting from sedimentation and deposition of debris into washes.

Cumulative Impacts. There would be no cumulative impacts from the no-action alternative.

Other visitor use and facilities in the NRA and project area contribute sediments and pollutants to Lake Mead. Other NRA projects (e.g., the *Lake Management Plan* and boat ramp improvements) are planned, and these are likely to have both beneficial and adverse impacts on water quality. The no-action alternative would not contribute to these actions.

Conclusion. There would be no change, directly or cumulatively, in water quality or floodplains from the no-action alternative. There would be no impairment of floodplains or water quality associated with this alternative.

Air Quality

Because no action would be taken in this alternative, there would be no change in direct or indirect impacts on air quality as a result of the no-action alternative.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting air quality include the effects of the increased development and population growth in the region, most notably the Las Vegas area. The no-action alternative would not contribute to these actions.

Conclusion. There would be no change in impacts to air quality from the no-action alternative. There would be no impairment of air quality associated with the no-action alternative.

Soils

Because no action would be taken in this alternative, there would be no change in direct or indirect impacts on soils as a result of the no-action alternative.

Cumulative Impacts. There would be no cumulative impacts from the no-action alternative.

Conclusion. There would be no impacts to soils from the no-action alternative. There would be no impairment of soils associated with this alternative.

Visitor Use and Experience

The no-action alternative would leave the road with existing tight curves and narrow lanes with gravel shoulders. There would be no change in the number of pullouts. Although it is not anticipated that the road condition would affect visitation numbers, the experience of driving a narrow road while towing a trailer can cause frustration and anxiety. Congestion and circulation confusion would continue in the parking area, causing backups and delays for visitors launching boats during peak time or trying to park to use concessioner facilities. The no-action alternative would not impact on-going activities such as fishing tournaments. There would be no change in direct or indirect impacts on visitor experience because no action would be taken in this alternative. However, the existing condition constitutes a long-term, minor, adverse impact to visitor use and experience.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting visitor experience include a continued reduction in water levels at the lake, which have already caused closure of boat launch lanes and could lead to closure of the boat launch. If the boat launch were closed, the overall use of the Callville Marina would be greatly reduced, which would greatly reduce visitation to the area causing a long-term, major, adverse effect. On the other hand, if Callville Bay launch remains open and other boat launches close due to water level reduction, this could increase visitation at Callville Bay, adding to crowded conditions, additional traffic, and longer waits for launch facilities causing a long-term (depending on how long conditions last), moderate, adverse effect.

A second reasonably foreseeable action that could affect visitor experience is the improvement of the boat ramp. This would have a long-term, somewhat beneficial effect to visitor experience. The cumulative effects of the no-action alternative combined with other reasonably foreseeable actions would be long term, adverse, and moderate to major on visitor use and experience at Callville Bay.

Conclusion. The no-action alternative would have long-term, minor, adverse impacts on visitor experience from maneuvering tight curves and delays in the launch area. Cumulative effects would be long-term, adverse, and moderate to major. There could also be somewhat beneficial cumulative effects.

Health and Safety

The no-action alternative would leave the road with existing tight curves and narrow lanes with gravel shoulders. Callville Bay Road would probably continue to have a high accident rating compared to other NRA road segments. Congestion and circulation confusion would

continue in the parking area, potentially causing delays for emergency response vehicles, and placing pedestrians at risk. There would be no change to health and safety impacts from the no-action alternative; however, the existing condition constitutes a long-term, minor to moderate, adverse impact.

There would be no risk to construction workers from flash floods under the no-action alternative.

Cumulative Impacts. The cumulative effect of the no-action alternative, combined with other past and reasonably foreseeable actions affecting health and safety at the NRA include continued reduction in water levels at the NRA, which could lead to closure of the boat launch. If the boat launch were closed, overall use of the Callville Bay Marina would be greatly reduced, resulting in a large traffic volume reduction and, therefore, less potential for accidents along the road resulting in a somewhat beneficial impact on health and safety. Closure of other boat launches could lead to increase in traffic to Callville, which could increase the number of accidents along the road resulting in a long-term (depending on how long conditions last), moderate, and adverse impact on human health and safety.

Conclusion. The no-action alternative would have long-term, minor to moderate, adverse impacts on human health and safety from driving accidents and emergency response time. Cumulative effects would be long-term, moderate and adverse if other boat launches are closed. Cumulative impacts would be somewhat beneficial if Callville Bay were closed.

Concession Operations

The existing road condition would not be expected to affect visitor numbers at Callville Bay, so there would be no effects on local concessions from the no-action alternative.

Cumulative Impacts. Other reasonably foreseeable actions are as follows:

Past and reasonably foreseeable future actions affecting concession operations include a continued reduction in water levels at the lake, which could lead to closure of all of the boat launch. If the boat launch were closed, overall use of the Callville Marina would be greatly reduced as would visitation to the area. The resulting impact would be adverse and moderate to major for concession operations. However, closure of other boat launches could lead to an increase in traffic which would have a slight beneficial effect on operations for Callville Bay concessions, assuming Callville Bay Marina remained open.

A second reasonably foreseeable action that could affect concession operations is boat ramp improvements. This would have a long-term, slight beneficial effect to concession operations. The no-action alternative would not contribute to these actions.

Conclusion. The no-action alternative would not change concession operations at Callville Bay. Cumulative effects would be long-term and slightly beneficial if other boat launches were closed and/or the Callville Bay boat launch was improved. Cumulative impacts would be long-term, adverse, and minor to major if all of the Callville Bay boat launch was closed.

ENVIRONMENTAL CONSEQUENCES—ALTERNATIVE B: PREFERRED ALTERNATIVE

Biotic Communities

Aspects of this project with the potential to impact biotic communities include roadway reconstruction (realignment) and placement of extended culverts with concrete wing- and headwalls. Generally, rehabilitation activities such as asphalt removal, subexcavation of bed material, placement of new bed material, paving the road surface and shoulders, paving the pullouts and adding concrete curbs would disturb currently paved or graveled surface areas that do not support vegetation and are of no habitat value to wildlife. Construction of new roadway would result in the covering over of about 0.8 acres of desert wash habitat and approximately 4.3 acres of sparse desert shrub habitat.

Several measures would be taken to mitigate direct and indirect impacts, including selective positioning for equipment staging and material storage, defining construction zones and construction perimeters in the field, and saving and storing desert soil (and the soil seed bank) for restoration/revegetation of areas to be reclaimed (approximately 2.1 acres) within the corridor. Refer to the "Mitigation Measures for the Preferred Alternative" section of the alternatives chapter for a detailed discussion. As a result of implementing this alternative and the mitigation measures discussed, long-term, minor, adverse impacts on plant communities would be expected.

During construction some wildlife, particularly small mammals and reptiles, would be temporarily displaced. Some individuals would be killed outright or would be dispersed outside the construction limits and be susceptible to predation or competitive stress. This displacement would result in a slight population depression adjacent to the corridor, but following project completion and successful restoration, wildlife would again reoccupy restored portions of the project area. It is likely that certain larger species such as the bighorn sheep would avoid the road corridor during construction. Other large species (e.g., coyote and common raven) may be more visible as prey species are flushed or uncovered during ground disturbance or are made available as carrion. Implementing this alternative is expected to have short-term (duration of the project and revegetation/habitat restoration), minor, adverse impacts on wildlife.

Cumulative Impacts. Human activities within the NRA such as rehabilitation and maintenance of roads, buildings, recreational facilities, and visitor facilities have locally disturbed biotic communities and have the potential to do so in the future. Examples of recent reconstruction and rehabilitation work within the NRA include the Northshore Road and Lakeshore Scenic Drive. Short-term impacts to vegetation and wildlife would result from construction and maintenance activities and would be related to human presence, noise and vibration related to construction vehicles and activities, dust generation, etc. Long-term impacts to vegetation would result from covering of habitat by the road template, habitat fragmentation, potential for introduction of exotic species via vehicles, wildlife/vehicle collisions, etc. The reconstruction and rehabilitation work on the Callville Bay Road, added to

other past, present, and future work on transportation corridors in the NRA, would be expected to result in short- and long-term, negligible, adverse cumulative impacts on vegetation and wildlife.

Conclusion. This alternative is expected to have localized, short-term and long-term, minor, adverse impacts on biotic communities in the NRA. Cumulative adverse impacts would result for vegetation and wildlife relative to other roadway improvement projects within the NRA (such as future rehabilitation along Northshore Road), but these are expected to be short-term and negligible. There would be no impairment of biotic communities from this alternative.

Threatened and Endangered Species, Species of Concern

Impacts to the desert tortoise, chuckwalla, and banded Gila monster, relative to the Callville Bay Road project, would be eliminated by the mitigation measure of constructing a permanent desert tortoise fence. As a result of this mitigation, the preferred action is not likely to adversely affect the desert tortoise. During construction, some harassment of the desert tortoise, chuckwalla, and banded Gila monster would occur from increased levels of human activity, noise, and the ground vibrations produced by vehicles and heavy equipment in the short term. However, long-term impacts to individual desert tortoises should decrease because permanent tortoise fences would preclude their access to the road surface and guide them to culvert crossings, a long-term beneficial effect. As a result of implementing this alternative, short-term, negligible, adverse impacts on the species would be expected.

Individual desert tortoises on the ground surface or in burrows within the construction limits could be killed or injured by construction vehicles or "harassed" by removal to a safer location during road rehabilitation work. This would result in short-term, adverse impacts. Desert tortoise eggs could be destroyed. Such impacts would be minimized by clearly marking clearing limits outside of the existing road prism and by providing a permanent desert tortoise fence to prevent individuals from accessing the construction zone. Desert tortoise surveys would be completed prior to construction and any burrows present near the project boundary would be avoided, if possible, and protected with fencing. Any handling of desert tortoises would be performed by a qualified biologist, in accordance with procedures outlined by the Service.

Indirect, adverse impacts related to capture or harassment of desert tortoises by construction personnel and attraction of the common raven to the area by trash accumulation could occur over the short term. However, each project employee would be informed of the desert tortoise presence, the species' threatened status, and the protocol to be used upon its observation. Additionally, a litter control program would be implemented during construction.

Plant species of concern, e.g., the Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, Gold Butte moss, and seriate crossidium moss would be lost to construction, if present within the reconstructed road template. This would result in localized, long-term, minor, adverse impacts to individuals and habitat for plant species of concern. These habitats include gypsiferous and sandy soils in the region. A survey would be conducted to determine the presence/absence of rare plant species and desert soils would be stockpiled to preserve any

seed present. Stockpiled desert soils would be placed on a site near the point of origin, ensuring that gypsophile (Las Vegas bearpoppy, Gold Butte moss, and seriate crossidium moss) seeds would be returned to a similar habitat with gypsiferous soils and the other two plant species of concern (threecornered milkvetch and sticky buckwheat) to more appropriate desert soils, e.g., predominantly sand, sand and cobble, and randomly strewn boulders.

Cumulative Impacts. Reconstruction of the Callville Bay Road would occur within lands located in the natural environment or environmental protection subzones of the NRA, which emphasize conservation of natural resources and provision for environmentally compatible recreational activities. For future road improvement projects, impacts to the desert tortoise would be localized, short-term, negligible and adverse during construction, but would be long-term and slightly beneficial following construction due to the placement of permanent desert tortoise fencing. This action would have a long-term, slight beneficial cumulative impact to the desert tortoise population east of the city of Las Vegas, in Clark County. The development of private land in the vicinity of Las Vegas and its suburbs and the associated loss and degradation of desert tortoise habitat is expected to continue into the future. Actions on private lands, such as urban development, recreation, and grazing would continue to contribute to habitat degradation and loss for the desert tortoise.

The Service issued an incidental take permit pursuant to section 10(a)(1)(B) of the Endangered Species Act to Clark County and the cities of Las Vegas, North Las Vegas, Henderson, and Boulder City (24 July 1991). This permit authorizes incidental take of desert tortoises on non-federal land in the permit boundaries. When reviewed within the regional expanse of Clark County and the geographical extent of the Mojave Desert habitat available for the desert tortoise population, the beneficial impact realized along the rehabilitated portion of Callville Bay Road would be small, resulting in a long-term, slight beneficial, cumulative impact.

Conclusion. Approximately 5.1 acres of very low, to low density desert tortoise habitat would be permanently lost adjacent to the existing roadway. This habitat was considered to be mostly uninhabited and abandoned by the desert tortoise and would be taken in narrow strips or bands parallel to the roadway. The affected habitat includes approximately 0.8 acres of desert wash and approximately 4.3 acres of sparse desert shrub. Approximately 2.1 acres of previously disturbed habitat would be revegetated adjacent to the existing roadway. Road use would continue to result in depressed desert tortoise numbers immediately adjacent to the road; however, individual desert tortoises attempting to cross the road surface would be deterred or guided to a safe crossing point (culvert) by permanent fencing.

This alternative is expected to have localized, short-term, negligible, adverse impacts on the desert tortoise during construction. Following construction, long-term, minor, beneficial impacts would result from the installation of permanent desert tortoise fencing. Therefore, the project is not likely to adversely affect the tortoise. Species of concern, if they are determined for the project vicinity, would receive localized, long-term, minor, adverse impacts on potential habitat for the chuckwalla, banded Gila monster, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, Gold Butte moss, and seriate crossidium moss. There would be

no impairment of threatened and endangered species, species of concern, or designated critical habitat associated with this alternative.

Floodplains and Water Quality

Section 404 of the Clean Water Act authorizes the USACE to prohibit or regulate, through a permitting process, discharge of dredged or fill material into U.S. waters. Although wash channels within the project area are dry most of the year, they flood occasionally during the later summer monsoon season. Floods can last up to several hours, and the ephemeral washes are considered navigable waters of the United States. About 5,100-cubic yards (3,900-cubic meters) of fill, primarily earth removed from cut sections elsewhere on the project, would be placed within dry wash channels along reconstructed segments of Callville Bay Road. This amount is the minimum necessary to meet the project objective of improving the road for traffic safety. Pullouts, which require increased road width, would not be located within washes to avoid impacts associated with additional fill.

The total channel surface area that would be affected by deposited fill is estimated to be 0.8 acres (0.3 hectares) (J. Bellen pers. com. 2002). A permit from the USACE for minor discharges of dredged or fill material into U.S. waters would be required, pursuant to section 404 of the Clean Water Act. The USACE would consider each crossing as a complete and separate project. The work would thus meet the threshold requirements of Nationwide Permit #14, and would be authorized by this nationwide permit.

The rehabilitated Callville Bay Road would cross small washes and the larger wash in several locations. Road culverts would allow water to flow under the road and along the washes during flood events, but the form and flow dynamics of the wash channel would nonetheless be altered by fill material. Assuming the culverts are installed correctly and appropriately sized, there should be no chronic adverse impacts to the floodplain. In the short term, there would probably be increased localized erosion (particularly at wash margins) and sedimentation, a minor, adverse impact.

Erosion and sedimentation are also the most important processes related to water quality impacts of the road project. Erosion occurs when soil particles, sand, small rocks, and the like (sediments) are swept up and carried along by moving water, as from a rainstorm. Sediments in project area floodwaters eventually drop out farther along the watercourse or wash, or they are carried into Lake Mead. Some degree of erosion and sedimentation is normal, but the process accelerates when desert soils and gravel are loosened or otherwise disturbed by activities such as construction and limited illegal off-road recreational use.

Project sites would be most vulnerable to sedimentation and erosion during construction due to exposure of cut slopes, topsoil, fill material, and the like to natural elements. After construction, road surfaces would be paved and slopes and fill stabilized. Rainstorms are most likely during the monsoon season in July, August, and early September. If possible, project construction activities would be conducted during the non-rainy season to avoid flash flood events that would exacerbate erosion and sedimentation impacts.

Using BMPs for controlling nonpoint pollution during construction would help to control sedimentation and erosion during small storm events. If a major rainstorm were to occur during construction, however, sediments could be carried all the way to Lake Mead and contribute to water turbidity (cloudiness) in the lake. If severe, turbidity can reduce light penetration and visibility, affect aquatic organisms, and reduce the ability of predatory fish and birds to see their prey. It can also make waters less attractive for recreation, fill reservoirs, and block water intakes. Depending upon the extent to which storm events were avoided during construction, short-term, adverse impacts on water quality from increased erosion, sedimentation, and turbidity would range from negligible to minor.

A small amount of fill that was placed in washes when the road was originally constructed would be removed, thus restoring about 0.1 acres of dry wash channel that is subject to flash flooding. This would constitute a long-term, slightly beneficial impact.

Cumulative Impacts. Other visitor use and facilities in the NRA and project area contribute sediments and pollutants to Lake Mead. Other NRA projects (e.g., the *Lake Management Plan* and boat ramp improvements) are planned, and these are likely to have negligible impacts on water quality that would be both beneficial and adverse. The cumulative effect of the preferred alternative on floodplains and water quality, in combination with other past, present, and reasonably foreseeable future events, would be short term, adverse, and negligible.

Conclusion. The preferred alternative would have minor, short-term, localized adverse impacts on floodplains. Impacts on water quality would be short term and negligible to minor, depending on the extent to which construction could be conducted without a major storm event occurring. Cumulative impacts would be short term, adverse, and negligible.

The project would be authorized by Nationwide Permit #14 from the USACE for minor discharges of dredged or fill material into U.S. waters, pursuant to section 404 of the Clean Water Act. Compliance with Executive Order 11988 (*Floodplain Management*) is not required for this project because entrance, access, and internal roads to or within units of the National Park Service are excepted actions (NPS 1993). Thus, a Statement of Findings for floodplains will not be prepared.

There would be no impairment of floodplains or water quality from this alternative.

Air Quality

The preferred alternative would temporarily affect local air quality through increased dust and vehicle emissions. Hydrocarbons, nitrous oxide, and sulfur dioxide emissions would be largely dispersed by prevailing winds in the project area. Dust stirred up by construction equipment would increase airborne particulates intermittently, but this phenomenon is not expected to be appreciable. Mitigating measures such as water sprinkling to reduce dust and limit idling of construction equipment would be used, as appropriate, to mitigate effects. Impacts from dust and construction equipment emissions would be short term, adverse, and minor.

Cumulative Impacts. Air quality at Lake Mead NRA is affected by a variety of internal and external factors such as power plants, motor vehicle emissions, and urban industrial sources. Long distance transport of pollutants, which would be unaffected by the preferred alternative and reasonably foreseeable actions, would continue into the future, with anticipated emission levels remaining similar to existing levels. Impacts to air quality from other construction projects would be short term, lasting only as long as the construction, and negligible to minor. The short-term, minor impacts associated with the preferred alternative, in conjunction with the effects of reasonably foreseeable actions, would result in negligible to minor effects. The intensity of effects would depend on the number and timing (i.e., if they are simultaneous) of construction activities.

Conclusion. Overall, there would be minor, short-term degradation of air quality from construction-generated dust and emissions from construction equipment. Cumulative effects would be negligible and adverse. There would be no impairment of air quality from this alternative.

A dust control permit from Clark County, Nevada Health District, Air Pollution Control Division would be required.

Soils

The three existing parking lots at the marina cover 17.8 acres (7.2 hectares). The area that would be disturbed within the existing marina parking lots for relocation of islands and resurfacing would be 10.3 acres (4.1 hectares) and all disturbance would be within the existing parking lots. There would be no new ground disturbance in the parking lot area (J. Bellen pers. com. 2002).

The existing roadway covers 18.7 acres (7.5 hectares). The total area disturbed for the roadway, including previously and newly disturbed land would be 26 acres (10.5 hectares). The total amount of previously undisturbed soil permanently affected by construction would be 5.2 acres (2.1 hectares) (J. Bellen pers. com. 2002).

About 2.1 acres (0.8 hectares) of previously disturbed ground (former roadway and removed pullouts) would be restored and revegetated. Rehabilitation and revegetation efforts would reduce scarring and loss of soil through erosion. Natural soil processes would be restored in rehabilitated areas only over the very long term, as soil structure slowly returned to a more natural condition.

No blasting activities should be required. Some trampling and compaction of soils by equipment and workers within the construction zone is expected, but soils in much of the construction zone have been previously disturbed by road-related activities. Local soil compaction would temporarily decrease permeability, alter soil moisture content, and diminish the water storage capacity of the generally xeric soils.

Construction activities associated with the preferred alternative would have long-term, adverse, minor impacts on soils.

Cumulative Impacts. Desert soils in surrounding communities are being affected in some areas by construction activities and development associated with population growth. Desert soils within the NRA are generally protected. Illegal off-road vehicle use and construction activities are the main causes of soil impacts in the NRA, but restoration activities are occurring on a broad scale, and preventative measures are being used to minimize future impacts. Additional foreseeable construction (e.g., new developed areas at Stewarts Point and Eldorado Canyon, NPS 2002c) would have new impacts on soils. The long-term, minor impacts associated with the preferred alternative, in combination with effects of current and reasonably foreseeable actions, would result in long-term, minor, adverse effects.

Conclusion. Overall, soil impacts associated with the preferred alternative are expected to be long term, adverse, and minor in intensity because impacts would be localized. Cumulative impacts would also be long term, adverse, and minor. There would be no impairment of soils or geologic resources from this alternative.

Visitor Use and Experience

During construction work on Callville Bay Road, visitors would experience up to 15-minute delays along the roadway, partial closure of parking lots, and reduced number of pullouts used for staging areas. Fishing tournament participants may be inconvenienced by the temporary loss of parking areas and the fish cleaning station. Mitigation measures specified in the construction contract include no work from one day before the holiday weekend through one day after the weekend, except for work that would not impact visitor ingress/egress to recreation facilities; and no work on the weekends. These measures would reduce impacts during the high use periods. The project is scheduled for completion by July 2003, again reducing impacts during high use periods. Short-term impacts would be minor and adverse in nature, since construction would be during low visitation periods. If the project extends into peak season or into weekends, the impacts would be moderate.

Upon completion of the preferred alternative, increased sight distances and wider travel lanes would improve driving conditions. Although it is not anticipated that the road condition would have any impact on visitation numbers, the driving experience would be improved. Circulation in the parking lots and boat launch areas would be improved reducing congestion, confusion, and possibly launch delays. The number of parking spaces would be reduced by six (2%).

The number of pullouts along Callville Bay Road would be reduced; however, sight distances would be increased making egress easier. Ongoing activities such as fishing tournaments would continue with no change from present. Therefore, long-term effects would be slightly to somewhat beneficial in nature.

Ongoing activities, such as fishing tournaments, would continue with no change from present.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting visitor experience include a continued reduction in water levels at the lake, which have always

caused closure of boat launch lanes, and could lead to closure of the boat launch. If the boat launch were closed, overall use of the Callville Marina would be greatly reduced, which would greatly reduce visitation to the area causing a long-term, major, adverse effect. The proposed action would not contribute to this impact. On the other hand, if Callville Bay launch remains open and other boat launches close due to water level reduction, this could increase visitation at Callville Bay, adding to crowded conditions, additional traffic, and longer waits for launch facilities causing a long-term, minor to moderate, adverse effect. The proposed action would have a slightly beneficial effect when combined with this action.

A second reasonably foreseeable action that could affect visitor experience is the improvement of the boat ramp. This would have a long-term, slightly to somewhat beneficial effect on the visitor experience. Therefore, both long- and short-term impacts associated with the preferred alternative could contribute beneficially to cumulative impacts.

Conclusion. The preferred alternative would have minor adverse impacts on visitor experience in the short-term, but slightly to somewhat beneficial effects for the long term. The cumulative effects of the preferred alternative combined with other reasonably foreseeable actions would be long term, slightly to somewhat beneficial if the boat ramp was improved. Long-term, adverse, cumulative impacts to visitor experience would be major if the boat launch were closed (reducing the utility of the marina) and minor to moderate if other launches were to close (increasing crowding at Callville Bay). The preferred alternative would not affect the first action and slightly benefit the later action.

Health and Safety

During the rehabilitation of Callville Bay Road, speeds would be reduced in construction zones resulting in fewer and less severe accidents in these segments. This would result in a short-term, slightly beneficial effect to health and safety.

If the project were completed as scheduled (July 2003), there would be no adverse risk to worker safety related to desert washes and flash floods. However, if the project is extended into July, August, and September, there is a greater risk of flash flooding. If this occurs, the construction contractor would be required to implement a safety plan for working in desert washes. With the application of a safety plan, the increased risk would be negligible adverse risk to worker safety related to desert washes and flash floods.

Upon completion of the preferred alternative, increased sight distances and wider travel lanes on Callville Bay Road would improve driving conditions. Drivers would be able to better anticipate road conditions and would be less likely to drop their vehicles off the road edge by accident, thereby maintaining control of their vehicles and reducing accidents. Roadside pullouts would have greater sight distances making egress safer.

At the Callville Bay developed area, a new pass-through lane would be created in the parking lots along with one-way circulation. Pedestrian and vehicular traffic would have greater separation, creating a safer environment for both. These improvements would also reduce congestion and response time for emergency vehicles.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting health and safety at the park, including continued reduction in water levels, could lead to closure of the boat launch. If the boat launch were closed, use of the Callville Bay Marina would be greatly reduced, decreasing traffic volume. On the other hand, other boat launches may close and Callville Bay launches may remain open. This would greatly increase traffic at the marina. Under the preferred alternative, the road and parking lot would be able to accommodate the increased traffic safely. The cumulative effect of the preferred alternative, combined with other reasonably foreseeable actions, would be a long-term, somewhat beneficial effect on health and safety.

Conclusion. The preferred alternative would have a long-term, somewhat beneficial effect on health and safety in the short term and the long term. The cumulative effect would be a long-term, somewhat beneficial effect on health and safety.

Concession Operations

During the construction phase of the project, NRA managers would inform the public of the project. This could cause some visitors to choose other areas for boat launching and lake access. However, construction work would not take place on weekends or around holidays, the highest visitation periods, and would be scheduled for completion by 2003. Concession operators would need to coordinate with NRA staff and the construction contractor prior to transporting houseboats on Callville Bay Road. Impacts to concession operations would be short-term, minor to moderate, and adverse during construction.

Upon project completion, it is not anticipated that the number of visitors would increase beyond projections. However, access to Callville Bay would be improved, as would commerce transportation along the roadway. This could lead to an indirect slightly beneficial effect to concession operations.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting concession operations include a continued reduction in water levels at NRA, which could lead to closure of the boat launch. If the boat launch were closed, overall use of the Callville Bay Marina would be greatly reduced, as would visitation to the area, which would have a major adverse impact on concession operations. However, closure of other boat launches could have a slightly to somewhat beneficial effect for Callville Bay concessions, assuming this marina remains open. Fluctuation in surface elevation (of the lake) below 1,180-feet above sea level would have tremendous financial consequences to marina operators (refer to the Bureau of Reclamation, *Final Environmental Impact Statement for the Colorado River Interim Surplus Criteria 2000* for more details).

A second reasonably foreseeable action that could affect concession operations is the improvement of the boat ramp. This would have a long-term, negligible beneficial effect.

The cumulative effects of the preferred alternative combined with other reasonably foreseeable actions would be long term, adverse, and major if the Callville Bay boat launch

was closed. On the other hand, the cumulative impact would be slightly to somewhat beneficial on concession operations if other boat launches closed and Callville Bay remained open. The improvement of the boat ramp would have a long-term, slightly beneficial effect on concession operations. The increment added to cumulative impacts by the road improvements would be negligible.

Conclusion. The preferred alternative would have a short-term, minor to moderate, adverse impact, and a long-term, slightly beneficial effect on concessions. The cumulative effect would be long term, adverse, and major if the Callville Bay boat launch was closed. The cumulative impact would be slightly to somewhat beneficial on concession operations if other boat launches closed and Callville Bay remained open. The improvement of the boat ramp would have a long-term, slightly beneficial effect on concession operations.

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_____. Lake Mead National Recreation Area Staff: Nancy Hendricks (Compliance Specialist); Mike Boyles (Wildlife Biologist); Dale Melville (Civil Engineer); Chanteil Walter (Compliance Technician); Robert Carnes.

_____. National Park Service Center Staff: Alan Woodrow (Landscape Architect).

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LEGAL CITATIONS

- Act of August 25, 1916 (National Park Service Organic Act), P.L. 64-235, 16 USC § 1 *et seq.* as amended.
- National Historic Preservation Act as amended, P.L. 89-665, 80 Stat. 915, 16 USC § 470 *et seq.* and 36 CFR 18, 60, 61, 63, 68, 79, 800.
- Native American Grave Protection and Repatriation Act, P.L. 101-601, 104 Stat. 3049, 25 USC §§ 3001-3013.
- Presidential Memorandum of April 29, 1994 "Government-to-Government Relations with Native American Tribal Governments," 59 FR 85.

- Clean Air Act, as amended, P.L. Chapter 360, 69 Stat. 322, 42 USC § 7401 *et seq*.
- Endangered Species Act of 1973, as amended, P.L. 93-205, 87 Stat. 884, 16 USC § 1531 *et seq*.
- Executive Order 11988: Flood Plain Management, 42 FR 26951, 3 CFR 121 (Supp 177).
- Executive Order 11990: Protection of Wetlands, 42 FR 26961, 3 CFR 121 (Supp 177).
- Executive Order 11991: Protection and Enhancement of Environmental Quality.
- Farmland Protection Policy Act of 1982, P.L. 97-98.
- Federal Water Pollution Control Act (commonly referred to as Clean Water Act), P.L. 92-500, 33 USC § 1251 *et seq*., as amended by the Clean Water Act, P.L. 95-217.
- Fish and Wildlife Coordination Act of 1958, as amended, P.L. 85-624, 72 Stat. 563, 16 USC § 661 *et seq*.
- National Environmental Policy Act of 1969, P.L. 91-190, 83 Stat. 852, 42 USC § 4321 *et seq*.
- Protection and Enhancement of Environmental Quality, E.O. 11514, as amended, 1970, E.O. 11991, 35 *Federal Register* 4247; 1977, 42 *Federal Register* 26967).
- Resource Conservation and Recovery Act, P.L. 94-580, 30 Stat. 1148, 42 USC § 6901 *et seq*.
- Secretarial Order 3175, Departmental Responsibility for Indian Trust Resources.
- Soil and Water Resources Conservation Act of 1977.
- Watershed Protection and Flood Prevention Act, P.L. 92-419, 68 Stat. 666, 16 USC § 100186.

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CONSULTATION AND COORDINATION

A press release was distributed in May 2002, requesting scoping comments related to the Callville Bay access road project. No comments were received.

Agencies and organizations contacted for information that assisted in identifying issues, or that will be given an opportunity to review and comment on this EA include:

FEDERAL AGENCIES

Bureau of Indian Affairs
Bureau of Land Management: Nevada and Arizona
Bureau of Reclamation
Environmental Protection Agency
Federal Highway Administration
Natural Resources Conservation Service
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
U.S. Forest Service

STATE AND LOCAL INDIVIDUALS AND AGENCIES OF NEVADA

Honorable Kenny Guinn, Governor
Honorable John Ensign, United States Senator
Honorable Harry Reid, United States Senator
Honorable Shelley Berkley, United States Representative
Chamber of Commerce: Las Vegas and Boulder City
City of Boulder City
City of Henderson
City of Las Vegas
City of North Las Vegas
Clark County
Colorado River Commission
Department of Administration, State Clearinghouse
Department of Transportation
Division of Parks
Division of Wildlife
Division of Environmental Protection
Division of Forestry
Division of Historic Preservation and Archaeology
Land Use Planning Advisory Committee
Regional Transportation Commission, Las Vegas
State Historic Preservation Office

LIBRARIES

Boulder City, Nevada
Clark County Community College
Clark County, Nevada
Las Vegas, Nevada
Mesquite, Nevada
Overton, Nevada
University of Arizona, Tucson
University of Nevada Las Vegas

NATIVE AMERICAN TRIBES

Las Vegas Band of the Southern Paiute
Moapa Band of the Southern Paiute
Pahrump Band of the Southern Paiute

OTHER GROUPS AND INDIVIDUALS

Citizen Alert
Mr. Dale A. Stirling
Defenders of Wildlife
Desert Tortoise Council
Desert Research Institute
Earth First
East LV Citizens' Advisory Council
Environmental Defense Fund
Environmental Forum
Fraternity of the Desert Bighorn
Friends of Nevada Wilderness
Grand Canyon Trust
Lake Mead Concessioners
Las Vegas Jeep Club
Mule Deer Foundation
The Nature Conservancy
Nevada Chapter
Nevada Conservation Forum
Nevada Wildlife Federation
Red Rock Audubon Society
Sierra Club
Sierra Club-Toiyabe Chapter
Southern Nevada Clean Communities, Inc.
Southern Nevada Environmental Forum
The Wilderness Society CA / NV
The Wildlife Society

THREATENED AND ENDANGERED SPECIES

Consultation and coordination relative to the federally listed desert tortoise and species of special concern, e.g., chuckwalla, banded Gila monster, Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat were accomplished, as follows:

- The Service has provided a species list for the NRA under the Lake Mead National Recreation Area Lake Management Plan and Environmental Impact Statement (24 May 2001, File No. 1-5-01-SP-504), in response to a letter from the National Park Service dated 24 April 2001.

- The Nevada Division of Wildlife was contacted and information requested 01 May 2002, via telephone, by the NRA wildlife biologist.

- The Nevada Natural Heritage Program was contacted via e-mail and facsimile and information requested by e^2M, 09 May 2002. They replied with a response letter on 28 May 2002.

- An informal consultation was used to begin the BA process, with an onsite meeting conducted 14 March 2002, between the NRA wildlife biologist and compliance director and the Service's Las Vegas field manager for the Nevada Fish and Wildlife Office (Hendricks pers com. 2002).

- A field survey for desert tortoise within the proposed project corridor was conducted by the NRA wildlife biologist and SCA volunteers 29 March 2002.

- A BA addressing federally threatened and endangered species was prepared by the NRA and submitted to the Service during May 2002.

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PREPARERS

This environmental assessment (EA) was prepared by engineering-environmental Management, Inc. (e^2M) under the direction of Mr. Bill Dickinson, Superintendent, Lake Mead NRA. Mr. Dickinson and Lake Mead NRA staff, especially Mike Boyles, Steve Daron, Nancy Hendricks, Dale Melville, and Chanteil Walter, provided invaluable assistance in the development and technical review of this EA. The preparers of this document are listed below:

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APPENDIX 1: NATIONAL PARK SERVICE PRESS RELEASE

National Park Service
U.S. Department of the Interior

Lake Mead
National Recreation Area

601 Nevada Highway
Boulder City, NV 89005

702 293-8907
702 293-8936

Lake Mead NRA News Release

May 15, 2002
For Immediate Release
Karla Norris, 702-293-8947
Karla_Norris@NPS.gov

Input Sought on Callville Bay Access Road Project

Lake Mead National Recreation Area is currently soliciting input in the formulation of alternatives and issues relating to the improvement of the Callville Bay Access Road and parking lot.

The purpose of the project is to rehabilitate the approximately 4-mile long Callville Bay Access Road. Project goals will be to rehabilitate the asphalt structural section, reduce accidents on the downgrade, and improve circulation in the launch ramp and parking areas.

Lake Mead National Recreation Area staff are working with the Federal Highways Administration to determine the options for improving the road and parking area. A full range of alternatives will be evaluated in an Environmental Assessment, in accordance with the National Environmental Policy Act.

The National Park Service is requesting assistance in the development of issues and alternatives for this road project. Comments will be used to determine the relevant issues that will be analyzed in the Environmental Assessment.

Please send your comments to the following address:

Lake Mead National Recreation Area
Attention: Callville Bay Access Road Comments
601 Nevada Highway
Boulder City, Nevada 89005

Comments should be received by May 30, 2002.

-NPS-

Return to Lake Mead Announcements and Press Releases | Return to Front Page

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APPENDIX 2: CONSULTATION LETTER SENT TO U.S. FISH AND WILDLIFE SERVICE

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United States Department of the Interior

NATIONAL PARK SERVICE

LAKE MEAD NATIONAL RECREATION AREA
601 NEVADA HIGHWAY
BOULDER CITY, NEVADA 89005

IN REPLY REFER TO:
L3031 (LAME-RM)

May 30, 2002

Memorandum

To: State Supervisor, Nevada State Office, U.S. Fish and Wildlife Service, 1340 Financial Boulevard, Suite 234, Reno, NV 89502-2093

From: Superintendent, Lake Mead National Recreation Area

Subject: Biological Assessment for Rehabilitate Callville Bay Road Project, Lake Mead National Recreation Area, Clark County, Nevada

The purpose of this letter is to initiate formal section 7 consultation under the Endangered Species Act of 1973, as amended. Attached for your review is the Biological Assessment for the rehabilitation of Callville Bay road project.

The National Park Service (NPS) is proposing the rehabilitation of the Callville Bay access road and parking facilities within Lake Mead National Recreation Area. The Callville Bay access road is located at approximately mile 13 along Northshore Road. The entire four-mile stretch of the access road is proposed to be rehabilitated for safety reasons.

We have used the species list you sent us on May 24, 2001 (File No. 1-5-01-SP-504) to evaluate potential impacts to threatened, endangered, and species of concern from the proposed project. In addition, on March 14, 2002, biologists from our office met with Michael Burroughs of the Southern Nevada Field Office for the U.S. Fish and Wildlife Service, to assess the habitat and determine which species could potentially be affected by the proposed project. We have determined that the federally threatened desert tortoise is the only listed species that would be affected by the proposed action. An additional five species of concern, including the chuckwalla (*Sauromalus obesus*), banded Gila monster (*Heloderma suspectum cinctum*), Las Vegas bearpoppy (*Arctomecon californica*), threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*), and sticky buckwheat (*Eriogonum viscidulum*) may also be present in the habitat crossed by the proposed project.

The biological assessment evaluates the impact of the proposed project on these species and establishes mitigation measures. Based on the findings in the biological assessment, we have determined that the proposed project would impact approximately 5.1 acres of desert upland (4.3 acres) and desert wash habitat (0.8 acres) along Callville Bay Road. This habitat would be taken in narrow strips or bands along very low to low desert tortoise density habitat. In addition, 2.1 acres of previously disturbed roadway corridor would be restored and revegetated.

Mitigation measures will reduce the potential for direct and indirect impacts to individual tortoises and habitat during the construction period. Mitigation measures will also serve to protect the banded Gila monster and the chuckwalla. In addition, preconstruction surveys would occur to determine the presence of rare plant species. The primary means of preserving the plant species would be through the salvage and replacement of desert soils to preserve the seeds that may be present.

Road use would continue to result in depressed desert tortoise numbers adjacent to the existing roadway; however, future road use would have less effect on desert tortoise movement in the long term because a permanent desert tortoise fence would be constructed, providing safe passageway for the desert tortoise through culverts under the roadway.

With the mitigation measures suggested for the preferred alternative, we have determined that the effects of this rehabilitation project are negligible on the desert tortoise, and that long-term beneficial effects result from the installation of permanent desert tortoise fence along the roadway.

Please feel free to call Compliance Specialist Nancy Hendricks at (702) 293-8756 to answer any questions or to provide additional information. Thank you for your assistance.

William K. Dickinson

Attachment

APPENDIX 3: BIOLOGICAL ASSESSMENT SUMMARY

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EXECUTIVE SUMMARY

This Biological Assessment addresses the threatened desert tortoise (*Gopherus agassizii*), listed by the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act of 1973, as amended, relative to the Rehabilitate Callville Bay Road Project located at Lake Mead National Recreation Area, Clark County, Nevada. Callville Bay Road is proposed to be rehabilitated for safety reasons, as it has the second highest number of accidents of roads within the National Recreation Area. Rehabilitation would occur along the entire four-mile-long road segment and would include resurfacing the road with asphalt, adding asphalt shoulders, paved pullouts, restoring some existing pullouts, flattening some curves for sight distance, installing guardrail, installing curbs and gutter, and redesigning the parking lot at the marina on Lake Mead.

Two alternatives were evaluated: the no-action and the preferred action, e.g., rehabilitate Callville Bay Road. The no-action alternative would result in no changes to the existing roadway and consequently no additional impact, and only maintenance activities would be carried out on an as-needed basis. The safety issues would not be addressed. Roadway rehabilitation would address the safety issues and would also allow placement of permanent desert tortoise fencing to keep tortoises from crossing the roadway; rather, the fencing would force them to cross underneath using culverts.

An informal consultation between the U.S. Fish and Wildlife Service and the National Park Service was performed to begin the biological assessment process for this proposed rehabilitation project. Following the informal consultation, a field survey of the road corridor was conducted by the National Park Service resulting in no desert tortoise or desert tortoise sign being observed. The habitat immediately adjacent to Callville Bay Road was assessed to be uninhabited and abandoned by the desert tortoise.

Selection of the rehabilitate Callville Bay Road would result in negligible short- and long-term impacts to desert tortoise habitat that appears to be uninhabited and abandoned. Mitigation has been designed to lessen the habitat impact, resulting in the permanent take of 5.1 acres of desert tortoise habitat and restoration of 2.1 acres of previously disturbed habitat, e.g., abandoned previously surfaced areas of road and pullouts. The habitat receiving permanent impacts, e.g., covering by roadway fill and/or asphalt occupies linear strips along the existing roadway.

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LIST OF FIGURES

LIST OF TABLES

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INTRODUCTION

In accordance with section 7(c) of the Endangered Species Act of 1973, as amended (16 USC 1531 *et seq*.), the National Park Service (NPS) requested from the U.S. Fish and Wildlife Service (Service) a species list of threatened and endangered species, species of concern, and designated critical habitats that may be affected by NPS proposed action to Rehabilitate Callville Bay Road in Lake Mead National Recreation Area (NRA), Clark County, Nevada. It is the responsibility of the federal agency proposing the action, in this case the National Park Service, to determine whether the proposed action would adversely affect any listed species or designated critical habitat; this determination is documented in a Biological Assessment (BA). The objective of a BA is to determine whether an endangered or threatened species is likely to be adversely affected by the proposed action.

The Service provided a list of threatened and endangered species (USDI-FWS 2001) (**Attachment A**) that may be within or depend on the Callville Bay Road project area for critical habitat. A federally threatened species, the desert tortoise (*Gopherus agassizii*), would be affected.

Because the proposed Rehabilitate Callville Bay Road project is authorized, funded, and carried out by the National Park Service, consultation with the Service pursuant to 50 CFR § 402.14 was initiated.

An informal consultation was used to begin the BA process, with an onsite meeting conducted 14 March 2002, between the Lake Mead NRA wildlife biologist and compliance director and the Service Las Vegas field manager for the Nevada Fish and Wildlife Service Office (Hendricks 2002). This meeting was followed by a 29 March 2002 survey for desert tortoise within the Rehabilitate Callville Bay Road Project corridor, as proposed. The desert tortoise survey was conducted within the project limits by the NRA wildlife biologist and Student Conservation Association field crew.

An additional five species of concern, e.g., the chuckwalla (*Sauromalus obesus*), banded Gila monster (*Heloderma suspectum cinctum*), Las Vegas bearpoppy (*Arctomecon californica*), threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*), and sticky buckwheat (*Eriogonum viscidulum*) may also be present in the habitat crossed by the proposed project (USDI-FWS 2001, NNHP 2002). These species are also discussed within this BA.

This BA presents the alternatives and analyzes their impacts on the desert tortoise and its habitat. This BA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; regulations of the Council on Environmental Quality (40 CFR 1508.9); the National Park Service's Management Policies 2001; the Service's *Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act*, U.S. Fish and Wildlife Service and National Marine Fisheries Service, March 1998 (final); and the National Historic Preservation Act of 1966, as amended.

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DESERT TORTOISE

During the informal consultation process (Hendricks 2002), three impact types were mentioned by the Service, including: 1) construction and road widening impacts, 2) impacts related to increased speed following rehabilitation of the roadway, and 3) covering over desert wash habitat and removing caliche layers and caves (**Figure 1**). Recommendations from the Service were also made during this meeting and included: 1) obtain a U.S. Army Corps of Engineers (USACE) permit for adding fill into the desert washes, 2) provide desert tortoise fencing as appropriate, 3) potentially fence other sites in the NRA where higher densities of the desert tortoise exist (possibly to the north, along Northshore Road), and 4) require desert tortoise education and monitoring for construction crews. The first of these recommendations is being conducted under the scope of a larger environmental assessment effort.

FIGURE 1. REPRESENTATIVE DESERT TORTOISE DEN CONSTRUCTED UNDER CALICHE

The Rehabilitate Callville Bay Road Project would occur in the Mojave Desert scrub habitat (Sparse Desert Wash and Creosote Bush – White Bursage Sparse Shrubland) for the desert tortoise. Construction along this existing roadway would primarily affect previously disturbed (abandoned previously surfaced areas of road and pullouts), rarely used habitat (USDI-NPS 1994). Desert tortoise populations along the roadway have already received impacts, evidenced by the lack of signs of current habitation and limited signs of earlier habitation found during a 1992 desert tortoise survey (for the first 800 meters of habitat along Callville Bay Road only) (Hurst et al. 1992). The area immediately adjacent to the roadway can be considered mostly uninhabited and abandoned habitat.

However, there are incidental reports of desert tortoises crossing the Callville Bay Road (Boyles, pers. com. 2002). Perimeter surveys would need to be conducted farther from the alignment to determine if recent desert tortoise habitation has occurred. Construction may affect desert tortoises inhabiting areas on the perimeter of the project area or desert tortoises that enter into the project area from adjacent terrain.

Mitigation measures that would be implemented to further minimize adverse effects to the desert tortoise, including habitat loss, degradation, and fragmentation; direct mortality from construction activity; and common raven predation are presented as follows:

- The clearing limits (construction limits) outside of the existing road prism would be clearly marked or flagged prior to construction. All construction activities, including

staging areas, would be located within previously disturbed areas and fenced if necessary. Construction sites would be surveyed for desert tortoise presence, including burrows, prior to use. Permanent desert tortoise fence would be installed along both sides of Callville Bay Road for a majority of the corridor length, to deter individuals from crossing the construction zone and later the improved traffic lanes. The fence would act as a drift fence to direct desert tortoises through culverts under the road and allow access to habitat on both sides of the road (**Figure 2**).

- Use qualified and authorized biologists for all activities within the roadway corridor. An individual will be designated the field contact representative to oversee project compliance and coordination.
- All new culverts installed would be a minimum of 30-inches in diameter, providing adequately sized passageways for the desert tortoise.
- The project area would be surveyed by a qualified biologist for desert tortoises and their burrows and dens, immediately prior (within 24 hours) to the onset of construction in any given area. The results of the surveys would be to remove all desert tortoises currently on the project site and identify all burrows that may be avoided during construction. All desert tortoise surveys, handling of desert tortoises, and burrow excavation would be performed by a qualified or authorized biologist.
- Desert tortoise burrows found within the project area would be avoided if possible. They would be protected with desert tortoise-proof fence, placed at a minimum of 20 feet from the burrow on sides bordered by construction, to prevent crushing of underground portions of the burrow. The fencing would remain in place until construction in the vicinity was completed. Placement, inspection, and removal of fencing would occur under the direction of a qualified biologist.
- Desert tortoise burrows found within the project area that could not be avoided during construction, would be excavated by hand to determine if the burrows were occupied and to remove any desert tortoises present. All desert tortoises found within the project area, whether above ground or in excavated burrows, would be placed 300 to 1,000 feet outside of the clearing limits in the direction of undisturbed habitat. Handling and placement of desert tortoises would be performed in accordance with procedures identified in consultation with the Service. NPS biologists would be consulted prior to determination of the best time of year for excavation of burrows and relocation of desert tortoises.
- The contractor must protect against intrusion by the desert tortoise at sites with potential hazards (auger holes, steep-sided depressions, etc.).
- Construction personnel would be informed of the occurrence and status of the desert tortoise and would be advised of the potential impacts to desert tortoises and potential penalties for taking a threatened species. Following training of project staff, each trained individual would sign a completion sheet to be placed in file at the NRA (**Attachment B**).
- A litter control program would be implemented during construction to eliminate the accumulation of trash and to avoid attracting common ravens that may prey on juvenile desert tortoise (**Figure 3**). Trash would be removed to trash containers following the close of each workday, and disposed outside the NRA in a sanitary landfill at the end of each work week.

- Approximately 2.2 acres of desert tortoise habitat (2.1 acres upland and 0.1 acres desert wash) disturbed by historic construction (existing pullouts) and maintenance activities would be revegetated and surface reclamation of the disturbed areas would be performed to advance recovery of the habitat. At a minimum, desert soil salvage, rocks, and plants; scarification and recontouring disturbed sites; replacement of desert soil, surface armor rock, and large rocks; seeding and planting with native species; and application of a chemical weathering agent to replicate the natural coloring of the surface layer would be considered.

FIGURE 2. PERMANENT DESERT TORTOISE FENCING

OTHER SPECIAL STATUS SPECIES

FIGURE 3. COMMON RAVEN ATTRACTED TO FISH CLEANING STATION IN PARKING LOT

Five federal candidate wildlife and plant species may occupy habitat in the Callville Bay Road area, and include *Sauromalus obesus* (Chuckwalla), *Heloderma suspectum cinctum* (Banded Gila monster), *Arctomecon californica* (Las Vegas bearpoppy), *Astragalus geyeri* var. *triquetrus* (threecorner milkvetch), and *Eriogonum viscidulum* (sticky buckwheat) (USDI-FWS 2001, NNHP 2002).

Chuckwallas are present in southern Nevada, southern Utah, southeastern California, western Arizona, southern Baja California, and west-central Sonora. The species is considered widespread and common in California and much of Arizona; however, Nevada ranked the chuckwalla status undetermined due to lack of information or substantially conflicting information about status or trends (NatureServe 2002d). The greatest threats to the

chuckwalla are excessive collecting and habitat destruction, including habitat damage resulting from collecting where rocks are overturned and fissures and exfoliations broken open.

Chuckwallas prefer rocky desert, lava flows, hillsides, and rock outcrops, where they bask on rocks and take shelter in rock crevices. Chuckwalla range is characterized by creosote bush and this herbivore browses on a wide variety of leaves, buds, flowers, and fruit (of various plant species), in addition to occasional insects (NatureServe 2002d).

The banded Gila monster is present in the Mojave Desert of Nevada, Arizona, and California. Little is known about the subspecies; however, it occupies Mojave desert scrub and desert grassland, typically in rocky areas (NatureServe 2002e). This large lizard may spend over 95% of its time underground or under cover of some type. The diet of banded Gila monsters consists of small mammals, eggs of ground-nesting birds and other reptiles, lizards, insects, and carrion. The subspecies can transmit a poison about as toxic as that of the western diamondback rattlesnake (*Crotalus atrox*), but must do so through a bite with chewing action.

The Las Vegas bearpoppy is typically found on gypsiferous soils in desert shrub communities. The habitat consists of open, dry, spongy or powdery, often dissected badlands; hummocked soils with high gypsum content, often with well-developed soil crust; in areas of generally low relief on all aspects and slopes; and associated with a sparse cover of creosote bush, saltbush, and blackbrush associations (NNHP 2001). It is a perennial forb that forms rounded clumps and produces a yellow flower (NNHP 2001, Welsh et al. 1993).

Threecorner milkvetch occupy sandy to fine-textured soil in mixed desert shrub communities. Specifically, the habitat is described as open, deep sandy soil or dunes, generally stabilized by vegetation and/or a gravel veneer (NNHP 2001). It is an annual forb with purple or pink-purple flowers that bloom in the spring.

The sticky buckwheat occupies desert wash, sand flats, roadsides, and deep sands with mesquite, creosote bush, white bursage, and indigobush among several other shrubs (NatureServe 2002f, NNHP 2001). Sticky buckwheat was also reported with salt-cedar and arrowweed in some sandy desert washes. It is an annual forb with small yellow flowers and blooms in April and May. The stems and branches are slightly sticky and are often covered with adhering sand particles.

Presence of the Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat would be determined using a preconstruction survey conducted at the appropriate time of the year. However, annual variability in the germination and survival success of winter annuals occurs in response to variation in rainfall, consequently the presence of threecorner milkvetch and sticky buckwheat could go undetected during a survey. The primary means of preserving individuals of these species would be through the salvage and replacement of desert soil to preserve seeds that may be present.

VEGETATION AND WILDLIFE

The existing Callville Bay Road was constructed through sparse desert shrub and desert wash plant communities of the Mojave Desert section of the American Semi-desert and Desert Province (NatureServe 2002a). A desert shrub community consisting of the Creosote Bush – White Burrobush Shrubland Association (NatureServe 2000a) is present and typically provides less than 5% foliar cover (**Figure 4**). This association occupies sandy or rocky desert soils and is dominated by creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), indigobush (*Psorothamnus fremontii*), beavertail cactus (*Opuntia basilaris*), cholla (*Opuntia* sp.), range ratany (*Krameria parvifolia*), and brittlebush (*Encelia farinosa*).

FIGURE 4. CREOSOTE BUSH – WHITE BURROBUSH SHRUBLAND OF THE PROJECT CORRIDOR

On gypsiferous soils, the short-shrub desert holly (*Atriplex hymenelytra*) was also observed. Gypsiferous soils along the Callville Bay Road corridor tended to be nearly devoid of vegetative cover (**Figure 5**).

The herbaceous understory of these sparse shrublands included desert trumpet (*Eriogonum inflatum*), six-weeks fescue (*Festuca octoflora*), and spineflower (*Chorizanthe* sp.). One small patch of sand adjacent to the roadway also supported the Spanish needle (*Palafoxia linearis*). All desert shrub species growing on the roadway edge and receiving additional moisture through runoff were more robust and typically were producing flowers and fruits.

FIGURE 5. DESERT HOLLY ON GYPSIFEROUS SOILS

Desert washes were present in the form of Callville Wash and its tributaries. One small tributary wash (approximately 5 meters wide) near Northshore Road was dominated by big galleta (*Hilaria rigida*), range ratany, threeawn (*Aristida* sp), and Nevada ephedra (*Ephedra nevadensis*) and had approximately 15 to 20% foliar cover (**Figure 6**).

Some intermediate tributary washes supported white bursage, rush bebbia (*Bebbia juncea*), Nevada ephedra, and indigobush, at times reaching and exceeding 10% foliar cover (**Figure 6**). Callville Wash ranges from approximately 10- to 30-meters wide and supported sparse stands and individuals of Nevada ephedra, indigobush, rush bebbia, white bursage, catclaw acacia (*Acacia greggii*), and honey mesquite (*Prosopis glandulosa*) (**Figure 6**).

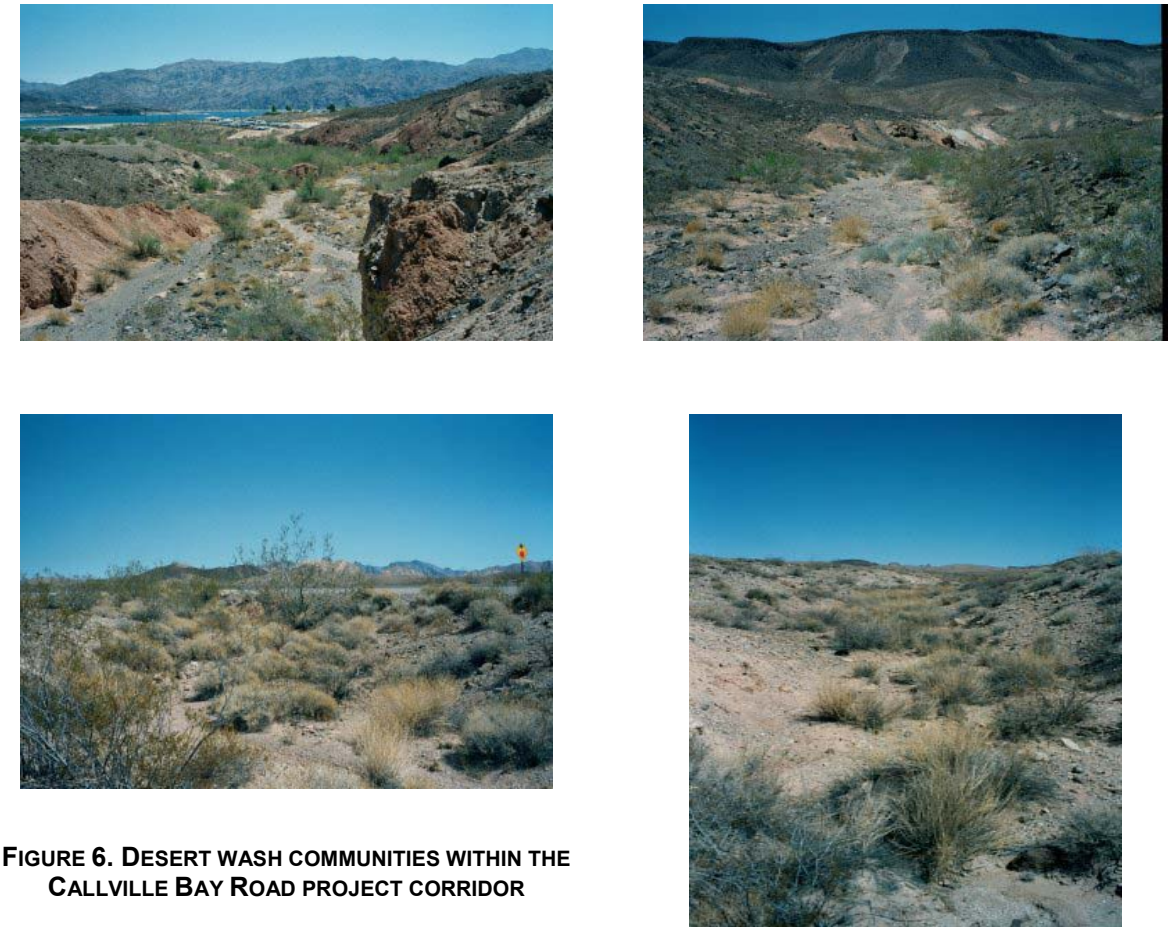

FIGURE 6. DESERT WASH COMMUNITIES WITHIN THE CALLVILLE BAY ROAD PROJECT CORRIDOR

Near the Lake Mead terminus of this corridor, Callville Wash supported stands of salt-cedar (*Tamarix chinensis*) and arrow-weed (*Pluchea (Tessaria) sericea*) at the roadway toe-of-fill (**Figure 7**). These stands would not be affected by road rehabilitation, which is confined to the top of the prism at this site. A small tributary drainage area, with a plugged culvert, is also present and the pooled water at the roadway toe-of-fill has been available in sufficient quantity to allow a decadent stand of salt-cedar to become established (**Figure 7**). Because of the sporadic water supply, this stand consists of approximately 80% dead salt-cedar stems and is revegetating to creosote bush. Salt-cedar is an exotic riparian shrub that is being actively

controlled at springs within the NRA, however, not along the Lake Mead shoreline to date (Hendricks, pers. com. 2002). The Nevada Weed Action Committee (NWAC 2002) considers salt-cedar a noxious weed within the state of Nevada.

FIGURE 7. SALT-CEDAR STANDS ADJACENT TO THE CALLVILLE BAY ROAD TOE-OF-FILL

Exotic species of plants have been introduced to the islands within the parking lots and as landscaping for dwellings and facilities. Species of palm trees, mulberry (*Morus alba*), oleander (*Nerium oleander*), juniper (*Juniperus* sp.), and Bermuda-grass (*Cynodon dactylon*), to name a few ornamentals and exotics, were noted. The tree species were planted to provide shade, as well as representing aesthetic plantings, in the parking areas. Disturbed soils along the roadway often supported the exotic annual Russian-thistle (*Salsola pestifer*). Exotic annual species are common for the first 2–3 years following desert soil disturbance and restoration, but are replaced by annual and perennial native species in the NRA.

FIGURE 8. EXOTIC LANDSCAPE PLANTINGS

Species of lizard were the most common wildlife observed within the corridor during an early May walking survey. Six common ravens were also observed during the site visit—three near the fish cleaning station in the parking area and three along the roadway. A pair of common ravens was observed occupying a cliff-face honeycombed with hollows (**Figure 9**); however, it could not be determined if nesting was occurring at this site. Common ravens are predators of young desert tortoise and the eggs and young of many wildlife species. Other wildlife observed near the developed areas included both native and exotic bird species, including the turkey vulture, common grackle, English sparrow, European starling, mourning dove, and cliff swallow.

Schwartz et al. (1978) listed 10 species of amphibians, 41 species of reptiles, and 70 species of mammals as occurring or potentially occurring within the NRA. Species such as the desert cottontail, Merriam's kangaroo rat, black-tailed jackrabbit, coyote, bighorn sheep, western banded gecko, desert iguana, zebra-tailed lizard, collared lizard, side-blotched lizard, and western whiptail are commonly observed wildlife species in the vicinity of Callville Bay Road.

DESERT TORTOISE BACKGROUND AND BIOLOGY

FIGURE 9. HONEY-COMBED CLIFF FACE WITH A PAIR OF COMMON RAVENS

Desert tortoises (*Gopherus agassizii*) are distributed from southeastern California, southern Nevada, and extreme southwestern Utah, through western and southern Arizona and northern Mexico (NatureServe 2002c and Boyles 1998) (**Figure 10**). They generally occupy habitat receiving an average annual rainfall in excess of four inches (10.0 cm) and below twelve inches (30.0 cm). The desert tortoise exhibits significant morphological and genetic variation throughout the range (NatureServe 2002c). Populations occurring west of the Colorado River are thought to be distinct from those east of the river in morphology, genetics, behavior, and ecology (Lamb 1989, 1994 in NatureServe 2002c). Populations of the desert tortoise are listed as threatened within the U.S. (*Federal Register*, 2 April 1990 and NatureServe 2002c).

FIGURE 10. DESERT TORTOISE

During the 1970s, it was apparent that desert tortoise populations were declining throughout a significant portion of the range. Many factors have been implicated, including: 1) land development, 2) off-road vehicle travel, 3) poaching and vandalism (including shooting), 4) disease (especially upper respiratory tract disease caused by a mycoplasma), 5) livestock, wild horse, and wild burro grazing, 6) habitat degradation due to exotic plant invasion, 7) range fires fueled by exotic annual grasses and forbs, 8) energy and mineral development, 9) road and highway traffic/collisions, 10) trail construction, 11) collecting, 12) predation by the common raven, coyote, feral dogs and cats (associated with human garbage dumps and backyard feedings), 13) release of non-native desert tortoises into areas occupied by native populations, and 14) natural droughts (resulting in poor nutrition and immunocompromise) (Oldemyer 1994, USFWS 1990, Jacobson et al. 1995, CDF&G 1990, Berry 1992 in NatureServe 2002c and Boyles 1998). The U.S. Fish and Wildlife Service listed the Mojave population of the desert tortoise (north and west of the Colorado River) as endangered under emergency listing procedures enacted in August 1989. In 1990, the desert tortoise was listed as threatened under normal listing procedures

The desert tortoise is predominantly herbivorous and a semifossorial inhabitant of warm upland plateaus and mountain slopes in the Mojave Desert. In the Mojave Desert, the desert tortoise occupies creosote bush scrub and the creosote bush – white bursage community. The native grass, big galleta is often present where the desert tortoise is most abundant. In general, desert tortoises forage primarily on native winter and summer annual plants (dicots and grasses), perennial grasses, cacti, and perennial shrubs in descending order of preference. Insects, caterpillars, and other insect larvae may also be eaten, and desert tortoises have been observed biting road-killed anurans and lizards (Grant 1936, Brown 1968, Okamoto 1995 in NatureServe 2002c). It has been suggested that an active adult desert tortoise requires about 45 lbs (21 kg) of herbaceous forage per month (NatureServe 2002c).

Optimal diet items include forbs, which are higher in protein, carbohydrate, lipids, calcium, crude fiber, and water. Forbs known in desert tortoise diets include *Eriogonum inflatum, Astragalus nuttallianus, Plantago insularis, Erodium cicutarium, Krameria parvifolia, Amsinckia* sp., *Camissonia* sp., *Descurainea* sp., *Lotus* sp., *Lupinus* sp., *Malacothrix* sp., *Gilia* sp., *Mentzelia nitens*, and *Nama* sp. Annual grasses important in desert tortoise diets are largely exotics and include *Bromus rubens, Schizmus barbatus, Festuca octoflora*, and the native *Bouteloua barbata*. Perennial grasses provide food, but also provide shelter, soil retention, and a longer growing season; these species include *Hilaria (Plueraphis) rigida, Muhlenbergia porteri*, and *Oryzopsis hymenoides*. *Sphaeralcea ambigua*, a shrub, is regularly ingested by the desert tortoise, and *Opuntia basilaris* buds, flowers, and fruits are also seasonally ingested (Berry 1978 in NatureServe 2002c).

Desert tortoises may sometimes ingest high-calcium materials such as limestone pebbles, caliche from layers along embankments, soil, and bones. The ingestion of calcium is most frequently observed in adult females and possibly in growing juveniles (Esque and Peters 1994, Marlow and Tollestrup 1982 in NatureServe 2002c).

Adult desert tortoises in the Mojave Desert are typically active from March through September, with a total active period of about four to five months per year. During the spring

season in the Mojave Desert, tortoises were observed to be active for about three hours every fourth day, and some tortoises did not feed for several weeks following spring emergence from dens (Behler and King 1979 in NatureServe 2002c). Desert tortoises were found to operate within the 25–35°C range of body temperatures.

Desert tortoise habitats are most often associated with well-drained sandy loam soils of plains, alluvial fans, and bajadas, although they may also occur along the edges of basaltic flow and other rock outcrops. In the Mojave Desert the sandy loam soils may be obscured by a veneer of desert pavement and burrows are most often proximate to washes and arroyos under these conditions. The desert tortoise has a tendency to excavate and utilize more than one burrow and juveniles are particularly prone to excavate multiple burrows (mostly under large shrubs) and also use abandoned rodent burrows (Woodbury and Hardy 1948, Luckenbach 1982 in NatureServe 2002c). Burrows often extend from one to eight feet in length and have a single opening. For the Mojave Desert, burrows most often open under a creosote bush (59–77% of the time) or white bursage (21% of the time) shrub.

Winter burrows are more properly called dens and are extensive, up to 30-feet in length. These dens open to southern exposures and are often subject to communal use by several individuals. Dens are typically excavated beneath caliche or sandstone rock shelves along wash banks (Woodbury and Hardy 1948 in NatureServe 2002c).

Mating occurs from August through October and again in April and May. The females may store sperm from the prior fall mating or even from prior years of mating. However, fertility declines as time since mating increases. Desert tortoise eggs are laid mainly from May to early July in shallow depressions, often 3- to 4-inches deep. Clutch sizes are normally 3 to 7 eggs, but up to 15 eggs have been observed in a nest. Most commonly, Mojave Desert tortoises construct egg nests inside the first two feet of the burrow floor, in the soil apron surrounding the burrow entrance, or in the shade of a shrub adjacent to the burrow. Newly hatched desert tortoises emerge from the nests in September and 83% of neonatal tortoises excavated new burrows or enlarged pre-existing rodent burrows in their first weeks (Niblick et al. 1994, Turner et al. 1984 and 1986, USFWS 1994 in NatureServe 2002c).

Under the Natural Resources Preservation Program, the National Park Service funded desert tortoise management programs to meet the goals and objectives of the Desert Tortoise Recovery Plan published in 1994 (Boyles 1998). This Recovery Plan recommended establishment of a system of Desert Wildlife Management Areas (DWMA) and the inventory and monitoring of desert tortoise populations over time, habitat enhancement and restoration of disturbed areas, and implementation of interpretive outreach and environmental education programs. Within the NRA, the following specific actions were taken:

- Cursory habitat surveys using 1.5-mile-long triangular transects distributed within 850,000 acres of potential desert tortoise habitat (600,000 acres in Arizona, 50,000 acres in the Gold Butte-Pakoon DWMA, 12,000 acres of critical habitat in Nevada, and an additional 175,000 acres of habitat in Nevada). One transect was placed for every 2,500 acres of potential, or 340 transects.

- Fourteen, one-kilometer square plots were also established, placed at diverse locations throughout the NRA and vary considerably in the terrain, remoteness, and degree of disturbance from human influences. Some plot locations were chosen based on previous knowledge of desert tortoise habitation in the area, others were selected following cursory examination of habitat suitability, and some were influenced by results of the previous year triangular transects.
- Twenty miles of burro exclusion fence were proposed to be constructed, eliminating burros from critical desert tortoise habitat in the Gold Butte-Pakoon DWMA.
- Ten miles of nonsystem roads were proposed to be closed and rehabilitated in desert tortoise habitat.
- Interpretive outreach and environmental education in the form of brochures and educational programs for contract workers has occurred.

These actions not only contribute to Recovery Plan objectives, but also increase the effectiveness of NRA management of the desert tortoise population (Boyles 1998). Detailed methods for plot establishment, plot survey, triangular transect survey, data collection, and use of staff/SCA volunteers are discussed in Boyles (1998). **Figure 11** provides the triangular transect and plot locations within the NRA.

HABITAT ASSESSMENT

The NRA is actively working with Clark County, Nevada; University of Nevada; Nevada Division of Wildlife; Arizona Game and Fish; U.S. Bureau of Land Management; and the U.S. Geological Survey (USACE) – Biological Resources Division to increase knowledge of the desert tortoise (USDI-NPS 1997.). Studies within the NRA include population surveys and monitoring, demographic studies to determine desert tortoise life span and causes of death, and planned future studies to determine the effects of wildland fires on the desert tortoise.

The habitat present in the vicinity of the northwestern segment of Callville Bay Road was assessed during the Rehabilitation of Northshore Road Project in February 1992. The first 800 meters of the Callville Bay Road was surveyed using 10-meter-wide zone-of-influence surveys at the 10, 100, 200, 400, and 800 meter distances (Hurst et al. 1992). It was considered very low- to moderate-density desert tortoise habitat (USDI-FWS 1995).

Because livestock grazing as an alternate land use is no longer practiced on the NRA, less impact has occurred than on grazed public and private lands. Exotic species have not invaded this habitat generally and are mostly limited to the road edge, parking lots within the project corridor, and lower Callville Wash. Six-weeks fescue was the most commonly observed exotic grass of desert washes in the project area.

Desert tortoises were observed historically in the area of the Callville Bay and Northshore Roads during inventory and research efforts (Schwartz et al. 1978). Schwartz et al. (1978) considered the desert tortoise as widespread but in small numbers throughout the NRA below about 4,000-feet elevation. Biologists surveyed the Northshore area of the NRA during the

period from 1995 through 1997, and determined it to have higher densities of the desert tortoise than most other areas of the NRA (Boyles 1998, Boyles 2002).

Specifically, a 1.0 km^2 study plot was established on Government Wash, located approximately five miles west of the Callville Bay Road site, and yielded observations of six (Spring 1996) and three (Spring 1997) live desert tortoise, with no recaptures (Boyles 1998). This plot was also surveyed for burrows, carcasses, shell remains, and scat. During 1997, seven sites with tortoise remains and 86 burrows were recorded in addition to the live desert tortoises. Additional data are available from four transects inventoried during 1995 (one transect) and 1996 (three transects) (Boyles 1998). All of these transects were north of the Northshore Road and are not located along Callville Bay Road. Desert tortoises are likely to be undercounted during dry years, as determined by an evaluation of factors affecting population assessments (Freilich et al. 2000).

HABITAT SURVEY RESULTS

Callville Bay Road was surveyed for sign of desert tortoise on 29 March 2002 by the NRA wildlife biologist and Student Conservation Association (SCA) assistants (Boyles 2002, Boyles pers. com. 2002). No desert tortoise sign (individual desert tortoise, burrows, dens, scat, old carapaces and bones, etc.) was observed along this 4.0 mile-long (6.0 km) roadway corridor (Boyles 2002). Boyles (2002) did not consider this a completely comprehensive search for desert tortoise, as it was confined to the project corridor, did not extend beyond the limits of construction for the proposed alternative, and utilized the assistance of interns with limited desert tortoise survey experience. Boyles stated further that: 1) the project corridor is located in occupied desert tortoise habitat, 2) habitat quality along the road is marginal, 3) habitat quality improves with increasing distance from the roadway and increasing distance from Lake Mead, 4) there are NRA records of the desert tortoise being observed on Callville Bay Road, and 5) to prevent desert tortoise mortalities the project corridor should be fenced and all the ground surveyed for desert tortoise immediately prior to construction activity.

Although not designed to be a desert tortoise survey, a walking or pedestrian review of the Callville Bay Road project corridor to support preparation of an environmental assessment was conducted by engineering-environmental Management, Incorporated (e^2M) staff on 01 May 2002. This walking survey was performed by a senior biologist familiar with Mojave Desert plant communities, habitats, and wildlife, accompanied by the e^2M landscape architect and cultural resources director, resulting in no observations of live desert tortoise or sign.

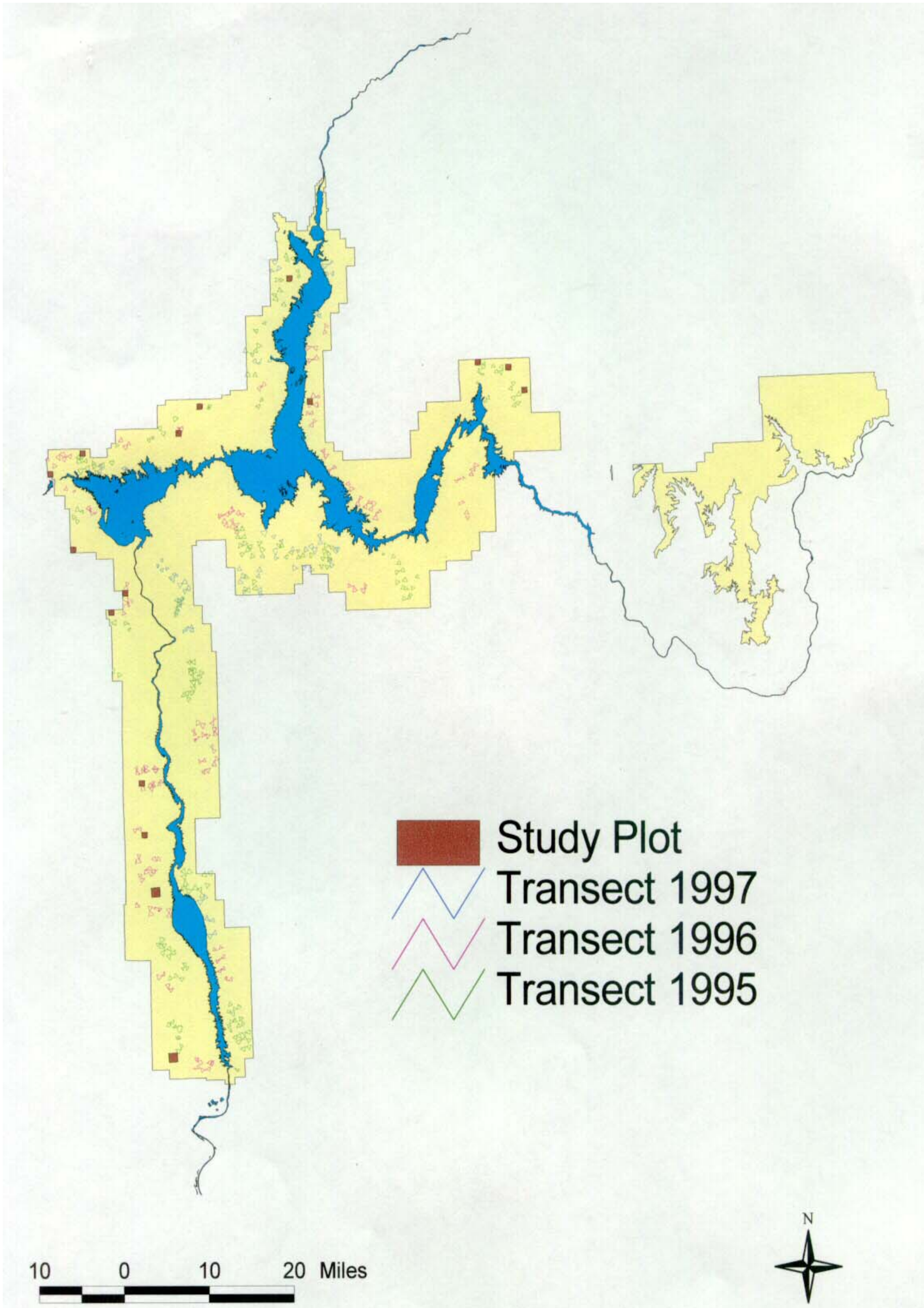

FIGURE 11. DESERT TORTOISE STUDY PLOT AND TRIANGULAR TRANSECT LOCATIONS WITHIN THE NRA

ENVIRONMENTAL CONSEQUENCES

This section provides an analysis of the environmental consequences to the desert tortoise. The desert tortoise was evaluated for both adverse and beneficial effects, short- and long-term effects, direct and indirect effects, impact intensity, context, and cumulative effects. Impacts related to both the no-action and the preferred action alternatives were addressed.

NO-ACTION ALTERNATIVE

Under the no-action alternative, there would be no new effects to the desert tortoise population adjacent to the existing Callville Bay Road. The area adjacent to the road appears to be uninhabited and abandoned habitat for the desert tortoise. The road is approximately 50 years old and even modest rates of road kills along it could have depressed any adjacent desert tortoise populations. The roadway may also be restricting movement and gene flow between populations on either side, although it is likely that desert tortoises occasionally successfully cross the road or travel under it through culverts, and some genetic exchange occurs.

CONCLUSION

No new effect. The desert tortoise population along Callville Bay Road would continue to be adversely affected by road use over the long term, including possible impairment of desert tortoise movements, and reduction in desert tortoise numbers adjacent to the road. Potential predators of the desert tortoise, including the common raven, would be attracted to the roadway as a source of carrion from road-kill wildlife and from trash discarded by visitors.

CUMULATIVE IMPACTS

The Callville Bay Road corridor lies within the boundaries of the NRA and there are no plans for additional development by the National Park Service in the vicinity. The surrounding lands are located within the natural environment or environmental protection subzones, which emphasize conservation of natural resources and provision for environmentally compatible recreational activities. The project site occupies desert tortoise habitat east of the city of Las Vegas, in Clark County. The development of private land in the vicinity of Las Vegas and its suburbs and the associated loss and degradation of desert tortoise habitat is expected to continue into the future. Actions on private lands, such as urban development, recreation, and grazing, would continue to contribute to habitat degradation and loss. The Service issued an incidental take permit pursuant to section 10 (a) (1) (B) of the Endangered Species Act of 1973, as amended, to Clark County and the cities of Las Vegas, North Las Vegas, Henderson, and Boulder City (24 July 1991). This permit authorizes incidental take of desert tortoises on non-federal land in the permit boundaries. When viewed within the regional expanse of Clark

County and the geographical extent of Mojave Desert habitat available for the desert tortoise population, the impact to desert tortoises along Callville Bay Road would be small.

PREFERRED ALTERNATIVE – REHABILITATE CALLVILLE BAY ROAD

Under the Preferred Alternative, road use would continue to affect the desert tortoise population adjacent to the roadway resulting in reduced desert tortoise densities and some impairment of desert tortoise movements. During construction, some harassment would occur from the increased levels of human activity, noise, and the ground vibrations produced by vehicles and heavy equipment in the short term. However, impacts to individual desert tortoise should decrease, because the installation of permanent fences will preclude their access to the road surface and guide them to crossings, using culverts under the road for a long-term beneficial effect.

Rehabilitation of the roadway, including asphalt removal, subexcavation of bed material, placement of new bed material, paving the road surface and shoulders, paving the pullouts and adding concrete curbs would disturb currently paved or graveled surface areas that are of no habitat value (**Table 1**). New roadway construction for realignment would result in the covering over of about 0.8 acres of desert wash habitat and approximately 4.3 acres of sparse desert shrub habitat that is considered of very low, to low desert tortoise density, because of its location adjacent to the road (**Table 2**). Following construction, approximately 2.1 acres of previously disturbed habitat would be restored using desert soil redistribution, reseeding, planting, and other revegetation/restoration techniques (**Table 2**).

Individual desert tortoises on the ground surface or within burrows within the construction limits could be killed or injured by construction vehicles or harassed through removal to a safer location during road rehabilitation work resulting in a short-term adverse impact. Such impacts would be mitigated by clearly marking clearing limits outside of the existing road prism and providing a permanent desert tortoise fence to prevent individuals from accessing the construction zone. Desert tortoise surveys would be completed prior to construction and any burrows present near the project boundary would be avoided if possible and protected with fencing. Any handling of desert tortoises would be performed by a qualified biologist, in accordance with procedures outlined by the Service.

Indirect adverse impacts related to capture or harassment of desert tortoises by construction personnel and attraction of the common raven to the area by trash accumulation could occur over the short term. However, each project employee would be informed of the desert tortoise presence, its threatened status, and the protocol to be used upon its observation. **Appendix B** provides the checklist used to brief/educate all employees associated with the construction project. Additionally, a litter control program would be implemented during construction.

Desert tortoise mitigation measures to reduce direct and indirect impacts to individuals and habitat during the construction period were presented under the alternatives section.

CONCLUSION

Approximately 5.1 acres of very low, to low desert tortoise density habitat would be permanently lost adjacent to the existing roadway. Approximately 2.1 acres of previously disturbed habitat, e.g., abandoned previously surfaced areas of road and pullouts, would be revegetated and restored adjacent to the existing roadway. Road use would continue to result in depressed desert tortoise numbers immediately adjacent to the road; however, individual desert tortoises attempting to cross the road surface would be deterred or guided to a safe crossing point (culvert) by permanent fencing.

CUMULATIVE IMPACTS

The cumulative impacts for this alternative would be the same as those described for the no-action alternative.

Impact Comparison Matrix

Table 1 provides a summary of environmental consequences on the desert tortoise related to the no-action and Rehabilitate Callville Bay Road alternatives. The reader is encouraged to review the plan view of proposed construction activities (**Attachment C**) to fully comprehend this summary table.

TABLE 1. ACTIVITY MATRIX DEPICTING THE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Alternative / Activity	Description
No-Action / Maintenance	No construction-related impacts to desert tortoise would occur under this alternative. Scheduled maintenance activities would be performed as necessary for roadway safety.
Rehabilitate / Shift Existing Roadway Alignment	The road alignment would be shifted to provide better sight distance and reduce curves for visitor safety. Longer culverts would be required at crossings of Callville Wash where the roadway would be realigned. Realignment would occur in the vicinity of stations: 10+800; 11+100; 12+000; 13+100; 14+600.
Rehabilitate / Guardrail Installation	New guardrail would be installed between stations: 11+28.939 and 11+264.852.
Rehabilitate / Pullout Installation	Pullouts would be installed at sites with adequate sight distance, between stations: 10+087.814 and 10+200.000; 10+530874 and 10+612.522; 11+298.214 and 11+445.783; 11+942.977 and 12+080.478; 12+580.000 and 12+729.200; 12+967.782 and 13+156.230; 13+948.175 and 14+068.000; 14+186.673 and 14+304.930; 14+496.453 and 14+682.409.
Rehabilitate / PCC Curb Installation	PCC Curb installation would be performed between stations: 10+760.000 and 10+880.000; 11+020.000 and 11+229.000; 12+260.000 and 12+320.000; 13+280.000 and 13+370.000; 13+370.000 and 13+440.000; 14+980.000 and 15+160.000; 15+160.000 and 15+300.000; 15+440.000 and 15+560.000.

Alternative / Activity	Description
Rehabilitate / PCC Curb & Gutter Installation	PCC Curb & Gutter installation would be performed between stations: 11+130.000 and 11+200.000; 12+860.000 and 12+900.000; 13+260.000 and 13+370.000; 13+370.000 and 13+440.000; 14+340.000 and 14+460.000; 14+850.000 and 14+900.000; 15+160.000 and 15+220.000; 15+380.000 and 15+440.000; 15+560.000 and 15+640.000.
Rehabilitate / Permanent Desert Tortoise Fence Installation	Permanent desert tortoise fencing would be installed between stations: 10+000.000 and 14+921.600

TABLE 2. IMPACT MATRIX DEPICTING DISTURBANCE TO DESERT TORTOISE HABITAT

Alternative / Activity	Description	Area Disturbed	Area Restored	Net Effect
No-Action / Maintenance	No change to roadway. Scheduled or emergency maintenance performed as necessary.	Existing Roadway = 18.7 ac. Existing parking area / boat ramp = 17.8 ac.	0 ac. 0 ac.	No change. No change.
Rehabilitate / All Elements	Realign segments, pave shoulders, guardrail, culvert installation, pave pullouts, curb, curb and gutter, permanent desert tortoise fence, parking lot redesign.	Existing Roadway = 18.7 ac. New disturbance / restoration = 7.3 ac. - Existing pullouts (abandoned) = 2.1 ac. - Desert Wash Habitat = 0.9 ac. - Desert Upland Habitat = 4.3 ac. Existing parking area / boat ramp = 17.8 ac. New disturbance = 10.3 ac.	 2.1 ac. 0.1 ac. 0 ac. 10.3 ac. (restored as new parking area & boat ramp)	 +2.1 ac. -0.8 ac. -4.3 ac. No change
Total (ac.)	All activities.	17.6 ac.	12.5 ac.	-5.1 ac.

Note: Parking area / boat ramp activities all occur on existing disturbed land, there would be no new disturbance.

DETERMINATION

Under the preferred alternative, approximately 5.1 acres of desert upland (4.3 acres) and desert wash habitat (0.8 acres) along Callville Bay Road would be lost to construction over the long term. This habitat would be taken in narrow strips or bands along very low to low desert tortoise density habitat that was considered mostly uninhabited and abandoned habitat for the species. In addition, 2.1 acres of previously disturbed (previously surfaced areas of road and pullouts) roadway corridor would be restored and revegetated. Future road use would have less effect on desert tortoise movement in the long term because permanent desert tortoise fences would be constructed, providing safer passage for the desert tortoise through culverts under the roadway. Due to placement of the permanent desert tortoise fence, an unknown area of undisturbed habitat would be unavailable for use. Upon the completion of final roadway design, this area would be calculated for proper compensation.

With the mitigation measures suggested for the preferred alternative, the National Park Service has determined that the effects of this rehabilitation project are negligible on the desert tortoise, and that long-term beneficial effects result from installation of permanent desert tortoise fence along the roadway. Considerations for the determination of a negligible effect to the desert tortoise and the likelihood of reducing the species' survival and recovery in the Mojave Desert included: 1) this project occupies an existing, highly traveled road corridor, 2) it lies outside areas designated for recovery of the desert tortoise, and 3) only 5.1 acres of habitat will be permanently lost to construction. A total of 2.1 acres of previously disturbed habitat, mostly on existing gravel pullouts, will be restored and revegetated. There would be no temporary impacts to desert tortoise habitat within this corridor, although temporary adverse impacts could occur to individual desert tortoises.

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MANAGEMENT RECOMMENDATIONS

With the listing of the desert tortoise as a threatened species, came the need for greater research and monitoring and the development of a formal recovery plan. To halt or reverse the decline of desert tortoise populations, the recovery plan recommended the establishment of a system of desert wildlife management areas and specific actions within them that would facilitate recovery. Included in the plan were inventory and monitoring methods, habitat enhancement and restoration of disturbed area recommendations, and the development of interpretive outreach and environmental education programs (Boyles 1998).

The National Park Service initiated a Natural Resources Preservation Program (NRPP), making funding available for five southwestern national park units to broaden their desert tortoise management programs in a manner consistent with the goals and objectives of the Recovery Plan. The four major components of the NRPP project were: 1) habitat identification surveys to determine distribution and relative density, 2) establishment and expansion of long-term monitoring plots, 3) habitat improvement and protection, and 4) interpretive outreach. For Lake Mead NRA the specific goals under the NRPP were: 1) conduct cursory habitat surveys across the 850,000 acres of potential desert tortoise habitat, 2) establish a long-term monitoring program, 3) construct burro exclusion fencing, and 4) close and rehabilitate nonsystem roads in desert tortoise habitat.

Future management of the project corridor relative to the desert tortoise would include, at a minimum, the following:

- Periodic inspection and repair of the desert tortoise drift fence, including inspection of culverts to ensure they remain open and are not blocked by rocks, sediments, or debris.
- Monitoring of revegetated sites to ensure that the effort is effective and that exotic species do not become dominant.
- Ensure that the environmental education program remains active so that desert tortoise fencing and revegetation areas are not vandalized out of ignorance and that feeding of the common ravens near the boat ramp and parking lot and improper trash disposal are discouraged.

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